A Special Need for Others:

Social Classroom Relationships and Behavioral Problems in Children with Psychiatric Disorders in Special Education

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ISBN: 978-94-6299-017-3

Cover design and layout: Apner Ontwerpbureau
Printing: Ridderprint BV

This research was supported by the Netherlands Organization for Health Research and Development (ZonMw), project number 15700.3011.

A Special Need for Others:

Social classroom relationships and behavioral problems in children with psychiatric disorders in special education

Sociale relaties in de klas en gedragsproblemen van kinderen met psychiatrische stoornissen in het speciaal onderwijs cluster 4

Proefschrift

ter verkrijging van de graad van doctor aan de
Erasmus Universiteit Rotterdam
op gezag van de
rector magnificus

Prof.dr. H.A.P. Pols

en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op
donderdag 26 maart 2015 om 15.30 uur

door

Linda Daniëlle Breeman

geboren te Leidschendam

Promotiecommissie

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Chapter 1

General Introduction

Children with psychiatric disorders are at risk for experiencing poor psychosocial, emotional, and behavioral adjustment after leaving school (Heijmens Visser, Van der Ende, Koot, & Verhulst, 2003; Wielemaker, 2009). These children thus need a good educational environment in order to optimally develop despite their impairments. Yet, some of these children have such complex special educational needs that they are placed in settings for special education. Especially these children could benefit from education that also targets their social, emotional, and behavioral skills in an educational environment that is adapted to their needs.

Research has consistently shown that children's social, emotional, and behavioral classroom adjustment is affected by the dynamic and reciprocal interplay between the child and his or her teacher and between the child and his or her peers (Pianta, Hamre, & Stuhlman, 2003; Gifford-Smith & Brownell, 2003). However, most of this research has been conducted in general education and not much is known about the social dynamics in special education. However, such information can contribute to improving the special educational environment. This thesis therefore focuses on the social classroom dynamics (i.e., the interplay between children, their teachers, and their peers) that are part of the environment shaping the classroom adjustment of children with psychiatric disorders in special education. In addition, to help improve the educational quality in special education settings, we implemented and examined the effects of an intervention, The Good Behavior Game, on children's classroom adjustment, social classroom relationships, and teachers' sense of competence and wellbeing.

To give the reader a general introduction on the important topics of this thesis, this introduction starts with a discussion of special education from an international and national perspective. Next, the importance of positive teacher-child and peer relationships for children's classroom adjustment is discussed. Subsequently, a short introduction to the Good Behavior Game is given, followed by an overview of the design of the study. Finally, the research questions of this thesis are introduced together with an outline of the different chapters.

Special Education in an International Perspective

Many western nations, such as the U.S. and several European countries, signed the 'Salamanca statement' (UNESCO, 1994), which declares that children with disabilities and special educational needs have the right to be educated within the general educational system. Yet, approximately 1 to 5% of children in western nations are placed in settings for special education (Meijer, 2003; U.S. Department of Education, 2009). Educational facilities for special education can be ranked on

a continuum of restrictiveness, as they range from inclusive education in general education classrooms, in some cases combined with outside treatment in resource rooms, segregated classes in general education schools, special education schools, and also residential settings (Hocutt, 1996; Meijer, 2003; U.S. Department of Education, 2009).

Yet, there is much debate about adequate placement of children with emotional and behavioral disorders (EBD; Hocutt, 1996; Jull, 2008; Müller, 2010). The debate stresses the fundamental rights of children for inclusive education with typically developing peers, but also recognizes the concern that the minority must not disrupt the majority as not to endanger effective education of others (Cole, Daniels, & Visser, 2003). Also, it is often recognized that segregated educational settings can offer more specialized and individualized care to children with psychiatric problems (Cole et al., 2003; Hocutt, 1996; LCTI, 2006) as class size is usually much smaller in these settings than in general education and special education teachers have undergone additional training to work with children with special educational needs (Hocutt, 1996). This international debate has led to a wide variety of special education policies for children with psychiatric disorders and special educational needs, not only between the U.S. and Europe, but also among European countries (European Agency for Development in Special Needs Education, 2010; Meijer, 2003). Thus, although educational policies in western countries aim for inclusive education, all western countries offer - to a varying degree - segregated special educational facilities.

Dutch Special Education

Even before the Netherlands signed the Salamanca treaty, a similar statement was already incorporated in the so-called Dutch 'Weer Samen Naar School' (WSNS; translation: together to school again) policy, to reduce the growth of special education settings (Algemene Rekenkamer, 2005). In 2003, a new Dutch educational funding policy was instated: the development of a personal budget for children with disabilities (i.e., leerlinggebonden financiering, rugzakje), to facilitate inclusive placement in the general educational system, as parents, and thereby schools, were now provided with a budget to buy extra child support (Koster, Houten - Van den Bosch, Nakken, & Pijl, 2004; Ministerie OCW, 2003). This funding policy was accompanied by a new allocation policy and a transformation of the Dutch special educational system. Settings for special education were now divided into four different clusters with their own area of expertise regarding specialized care for children with severe disabilities and special educational needs. Cluster 1 offers

special education for the visually impaired, Cluster 2 for the hearing impaired and/or children with serious speech and language problems, Cluster 3 for children with cognitive and/or physical disabilities, and Cluster 4 for children with psychiatric disorders and severe emotional and behavioral problems (Ministerie OCW, 2003).

The specific criteria for including children in Cluster 4 settings stipulate that children must have at least one psychiatric disorder and must show severe behavioral problems - at school and at home - that together limit their participation in general education. In addition, the child must be known in a professional childcare institution (Ministerie OCW, 2003). Approximately one-third of the Dutch children who fulfill these criteria attend general education with extra classroom support, with the remaining two-thirds being placed in schools for special education (Inspectie van het onderwijs, 2010). Most children placed in these segregated settings for special education cope with autism spectrum disorder (ASD; 56%) or attention deficit/hyperactivity disorder (ADHD; 42%; LCTI, 2006; Stoutjesdijk & Scholte, 2009). In addition, when compared to special needs children who fulfill these criteria but attend general education, children placed in segregated schools for special education generally have a lower IQ and are more often diagnosed with multiple psychiatric disorders, indicating more severe emotional and behavioral problems (Inspectie van het onderwijs, 2010; Stoutjesdijk & Scholte, 2009). Therefore, these children are sometimes referred to as children with emotional and behavioral disorders (EBD; Stoutjesdijk, 2014). Because the number of children placed in segregated setting for special education increased sharply between 1995 and 2009 (LCTI, 2006; Inspectie van het onderwijs, 2010), a new Dutch educational policy, (i.e., Passend Onderwijs) has recently been instated to reduce the numbers of children in special education settings. This new policy aims for more individualized care of children with disabilities in general educational settings, for example, by making general education schools responsible for an adequate placement of children with disabilities (Ministerie OCW, 2014). Nevertheless, many children with complex psychiatric disorders are still taught in Cluster 4 settings today as these settings are better equipped to handle the complex special educational needs of many of these children.

The Importance of Positive Teacher-Child and Peer Relationships in Special Education

From a developmental systems perspective, teachers should focus on optimizing the dynamic social interactions in the classroom, between the children in class and between themselves and their students, to create an educational environment that aids children's social, emotional, and behavioral development (Lerner, 2006; Pianta et al., 2003). Empirical studies in general education have shown that a positive teacher-child relationship is associated with a variety of positive child outcomes such as the development of children's social skills (Cornelius-White, 2007), children's psychosocial adjustment in school (Buyse, Verschueren, Verachtert, & Van Damme, 2009), and children's school motivation (Maulana, Opdenakker, Den Brok, & Bosker, 2011). In addition, a negative teacher-child relationship is associated with undesirable outcomes such as peer dislike (Hughes, Cavell, & Willson, 2001), loneliness and depression (Maldonado-Carreño & Votruba-Drzal, 2011), and disruptive student behavior (Hamre, Pianta, Downer, & Mashburn, 2008; Spilt, Koomen, & Thijs, 2011). Next to teacher-child relationships, peer relationships may also impact children's classroom adjustment as these friendships provide children with a social mirror that is used to validate their developing self-image (Gifford-Smith & Brownell, 2003). Studies have demonstrated that especially negative peer interactions impact children's social, emotional, and behavioral classroom adjustment. For example, children's victimization by peers in the classroom has been associated with emotional problems such as anxiety and depression (Snyder et al., 2003; Vuijk, Van Lier, Crijnen, & Huizink, 2007), behavioral problems such as antisocial and aggressive behavior (Snyder et al., 2003), and social problems such as loneliness (Ladd, Kochenderfer, & Coleman, 1997).

In addition, studies have also shown that teacher-child and peer-child relationships can reinforce one another (Hughes & Chen, 2011; De Laet et al., 2014; Leflot et al., 2011; Mercer & DeRosier, 2008). Social referencing theory (Hughes, Cavell, & Willson, 2001) presumes that the teacher serves as a social referent for children, thereby allowing classmates to make inferences about children's likability based on their observations of teacher-child interactions. Yet, empirical studies showed that the effects of peers on teachers are stronger and more consistent than the reverse effect of teachers on peers (Mercer & DeRosier, 2008; De Laet et al., 2014). For example, peer rejection reduced the support children received from teachers two to three years later (De Laet et al., 2014; Hughes & Chen, 2011; Leflot et al., 2011; Mercer & DeRosier, 2008). It thus appears that teachers also make inferences about a child based on the child's interactions with peers, because

positive peer interactions may lead to more cooperation and engagement in the classroom resulting in teachers increasingly preferring this child (Hughes & Chen, 2011; Leflot et al., 2011).

Despite this theoretical and empirical evidence on the importance of social classroom relationships for children's social, emotional, and behavioral classroom adjustment, relatively little is known about the reciprocal interplay of different social classroom processes in special education settings. However, studies have shown that children with EBD may develop less positive teacher-child relationships (Murray & Greenberg, 2001; Toste, Bloom & Heath, 2014) and may encounter more difficulties with peers (Little & Kobak, 2003) than children without EBD. These findings are especially important because children with EBD may not only experience more negative interactions, they are possibly also more susceptible to positive and negative social interactions (Belsky, 1997).

The special education teacher can be regarded the main authority figure who has a responsibility in facilitating positive social classroom interactions. However, studies conducted in general education show that teachers are also influenced by these classroom processes and the same is probably true for special education teachers. For instance, children with psychiatric disorders may more often show classroom behavior that disrupts the educational process (Albrecht, Johns, Mounsteven, & Olorunda, 2009; Greene, Beszterczey, Katzenstein, Park, & Goring, 2002). Teachers can experience this as stressful and these job-related stressors may reduce teachers' sense of competency and wellbeing (Friedman, 2000; Maslach, Schaufeli, & Leiter, 2001). Lower levels of perceived competence and wellbeing may impact social relationships as it may affect the emotional support teachers provide their students (Brown, Jones, LaRusso, & Aber, 2010; Tom, 2012) and by causing more teacher-child conflict (Hamre, Pianta, Downer, & Mashburn, 2008). In turn, this may again lead to even more reduced teacher wellbeing (Spilt, Koomen, & Thijs, 2011; Yoon, 2002) and lower sense of competence in teaching (Spilt et al., 2011; Yeo, Ang, Chong, Huan, & Quek, 2008) and impact children's adjustment (Buyse, Verschueren, Verachtert, & Van Damme, 2009; Hamre et al., 2008).

Taken together, because both children and teachers play such an important role in generating positive social classroom interactions, it is important to extend our knowledge of social classroom processes in special education from the perspective of the teachers, the children, and their peers. Such evidence can then be used to improve or develop suitable pedagogical strategies for teachers to support the social, emotional, and behavioral development of these children. With this goal in mind, an important second objective of this thesis was to target special education

teachers through a teacher training program, the Good Behavior Game, to help improve children's emotional and behavioral adjustment and social classroom relationships.

The Good Behavior Game

The Good Behavior Game (GBG) is a classroom-based behavioral management program, conducted by teachers, designed to promote desired behavior in children (Barrish, Saunders, & Wolf, 1969). The basic principles of the GBG are in line with positive behavior support strategies such as the use of a token economy system and positive reinforcement to elicit behavior change. The core components of the Dutch adaptation of the GBG are structuring the classroom environment, reinforcing desired student behavior, and facilitating the extinction of undesired behavior (Van der Sar & Goudswaard, 2001). In many studies worldwide, the GBG has been found effective at reducing emotional and behavioral problems in general primary education (Nolan, Houlihan, Wanzek, & Jenson, 2014). In addition, there is preliminary evidence that the GBG may positively impact social relationships in class (Witvliet, Van Lier, Cuijpers, & Koot, 2009). To our knowledge, no earlier study has systematically examined the effects of the GBG on children with EBD and their teachers in special education. Yet, GBG studies did show that the intervention was most effective among children who had the highest levels of behavioral problems in general education (Kellam, Rebok, Ialongo, & Mayer, 1994; Van Lier, Vuijk, & Crijnen 2005) and may therefore also be beneficial for this population.

Design of the Study

Because one of the goals of this thesis was to test the effectiveness of the GBG, the study was conducted using a cluster randomized controlled design. Participating were 11 Dutch schools for special education for children with psychiatric disorders. All classes in these schools (grade 1-6) were invited to participate in the study. Five of these schools (23 classes) were assigned to the control condition (i.e., education as usual) and 6 schools (34 classes) to the intervention condition. After the randomization procedure, 6 classes within 3 intervention schools were not able to participate in the study due to problems present in these classes such as teachers resigning or having burnout problems. Therefore, our final study sample was comprised of 23 classes in the control group and 28 classes in the intervention group, including a total of 414 children at baseline measurement. Children and teachers within these classes were followed across one school year.

The children (87% boys) had a mean age of 10.1 years (range 5-13 years).

Information on children's IQ and psychiatric diagnoses were obtained from their school medical files. Children had a mean IQ of 88 (range 56-143). Children had at least one psychiatric disorder and many had comorbid disorders. Most common psychiatric disorders were ASD (42.8%), ADHD (39.9%), oppositional defiant disorder or conduct disorder (28.0%), anxiety disorder (5.3%) and mood disorder (3.4%).

At three times during the school year, questionnaires were completed by teachers and children in class. Data for the baseline assessment were collected in fall, before the start of the intervention (approximately 6 weeks after the start of the 2010/2011 school year). The second assessment was conducted in winter (approximately halfway through the school year) and the third assessment at the end of the school year during spring. See Table 1.1 for an overview of the questionnaires used in this thesis.

Research Questions, Aims, and Outline of this Thesis

This thesis will first focus on the characteristics of children and teachers in special education. Considering the importance of examining possibilities to reduce children's behavioral problems to improve the wellbeing of both teachers and children in special education, the first central research question of this thesis is: 'Do social classroom relationships affect the behavioral adjustment of children with psychiatric disorders in special education?' To answer this research question, I will focus on the importance of positive peer and teacher-child relationships for these children's behavioral adjustment in the classroom and possible ways for teachers to create positive social classroom relationships in special education. The second research question of this thesis is: 'Can the GBG improve social classroom relationships and children's behavioral adjustment?' To answer this research question, I will focus on the effects of the GBG on improving children's social classroom relationships and classroom adjustment in special education. Also, some attention is paid to the role of dosage and fidelity of the intervention implementation. Based on these two central research questions, the following 5 specific research questions are addressed in chapters 2-6:

In *chapter 2,* I focus on the research question: 'Do social classroom relationships, children's classroom adjustment, and teachers' competence and wellbeing differ between special and general education?' This chapter presents a comparison of the characteristics of our sample of teachers and children to normative population scores to establish the extent to which the children and teachers in special education differ from children and teachers in general education.

The focus of *chapter 3* is on the baseline data and the aim of this chapter is to develop a better understanding of the relationships between a variety of classroom processes on both the student and classroom levels. Specifically, this chapter examines the following research question: 'How are teacher characteristics, social classroom relationships and children's social, emotional, and behavioral classroom adjustment related to one another in special education?'

Subsequently, developmental processes within the school year are the focus of *chapter 4*. The research question examined in this chapter is: 'How do social classroom relationships and boys' behavioral problems influence each other during one school year in special education?' This chapter describes the developmental links between social classroom relationships - specifically the teacher-child relationship and peer relationships - and boys' behavioral problems during one school year.

In *chapter 5*, the results with regard to developmental links between the teacher-child relationship and behavioral problems are further explored by focusing on the two largest groups of children in special education: boys with EBD and boys with ASD. Specifically, the research question examined in this chapter is: 'Is the developmental impact of the teacher-child relationship and children's behavioral problems different for boys with EBD and ASD in special education?'

As a final step in this study project, in *chapter 6*, the possible beneficial aspects of the GBG are examined. Here, I focus on the research question: 'Can the GBG improve social classroom relationships and children's classroom adjustment?' Specifically, the aim of this chapter is to examine the effectiveness of the GBG on children's classroom adjustment, social classroom relationships, and teachers' sense of competence and wellbeing.

Finally, in *chapter 7*, the findings reported in the previous chapters are integrated and a reflection on the most important outcomes is given. In addition, implications for future research and educational practice are discussed.

Table 1.1
Overview of Measures Used in this Thesis

Subject	Construct	Measure
Children's classroom adjustment	Emotional and behavioral problems	Problem Behavior at School Interview (PBSI) Peer nominations of disobedient behavior
Social classroom relationships	Teacher-child relationships	Student Teacher Relationship Scale (STRS) Questionnaire on Teacher Interaction (QTI)
	Peer relationships	Dutch Class Climate Scale (DCCS) Peer nominations of social status
Teachers' sense of competence and wellbeing	Personal accomplishment and emotional exhaustion	Maslach Burnout Inventory for teachers (UBOS-L)
	Self-efficacy	Teachers' Sense of Efficacy Scale (TSES)

Chapter 2

Children and Teachers in Special Education: Sample Description

This chapter is based on the additional descriptive information provided in: Breeman, L.D., Wubbels, T., Van Lier, P.A.C., Verhulst, F.C., Van der Ende, J., Maras, A., Hopman, J.A.B., & Tick, N.T. (2015). Teacher characteristics, social classroom relationships, and children's social, emotional, and behavioral problems in special education. *Journal of School Psychology, Epub ahead of print.*

Sample Description

Our data on special education children and teachers were obtained from 11 Dutch schools for special education for children with psychiatric disorders (i.e., Dutch cluster 4 education). All children in grades 1-6 placed in one of these segregated settings at the start of the study were eligible for inclusion. The principals of 3 of these schools decided that, in total, 6 classes should not be able to participate in the study due to problems present in these classes such as teachers recently having resigned or experiencing burnout problems. After the exclusion of these 6 classes, 68 teachers gave their written informed consent. As a result, our target population consisted of 492 children taught by 68 teachers. Of those, 56 teachers were selected because they could be considered the main teacher who taught children most days of the week. These teachers completed questionnaires about the children and themselves. Written informed parental consent for participation in the study was obtained for 84% of the children, thus our final sample consisted of 414 children.

Goal of this chapter is to provide information on our sample of special education children and teachers. For this, we examined children's emotional and behavioral classroom adjustment, social classroom relationships, and teachers' competence and wellbeing at the beginning of the school year. To facilitate the interpretation of these scores, we compared these scores to those reported in studies conducted in general education. We used these normative population scores to establish the extent to which the children and teachers in special education in our study differed from children and teachers in general education.

Methods

Measures

Children's emotional and behavioral problems. Teacher ratings of children's emotional and behavioral problems were collected using the Problem Behavior at School Interview (PBSI; Erasmus Medical Center, 2000). The PBSI is a 43-item questionnaire in which children's emotional and behavioral problems are rated on a 5-point scale ranging from 1 (*never*) to 5 (*very often*). The Emotional problems scale is composed of two subscales (Anxiety: 5 items; Depression: 7 items; correlation between the two subscales r = .64; sample's Cronbach's alpha of the total scale .86; example item '*This child is nervous or tense*'). The Behavioral problems scale

is composed of three subscales (Attention deficit/hyperactivity disorder: 8 items; Oppositional defiant disorder: 7 items; Conduct disorder: 12 items; range of correlations between the subscales: .62-.79; sample's Cronbach's alpha of the total scale .96; example item '*This child disobeys teachers' instructions').*

PBSI scores as assessed in general education were available from an intervention study in general elementary education implemented in the Amsterdam region (Dijkman, 2012). Children from grades 1 to 6 participated in this study which took place between 2008 and 2010. Baseline data from the Emotional problems and Behavioral problems scales, collected before implementation of the intervention, were available for 3,527 children. These children's mean age was 7.9 years and 51% of these children were boys.

Table 2.1
Children's Psychiatric Diagnoses

Diagnoses	N (%)
Autism spectrum disorders	177 (42.8%)
Attention deficit/hyperactivity disorder	165 (39.9%)
Oppositional defiant disorder or conduct disorder	116 (28.0%)
Anxiety disorder	22 (5.3%)
Mood disorder	14 (3.4%)
Other	77 (18.6%)

Note. Children can have comorbid diagnoses.

Teacher-child relationships. Teacher reports of the relationship between teachers and individual children were collected using the Closeness scale of the Dutch Student Teacher Relationship Scale (STRS; Koomen, Verschueren, & Pianta, 2007). Closeness (i.e., warm and open communication; 11 items, sample's Cronbach's alpha .88) was measured using items such as '*I share an affectionate, warm relationship with this child*'. Items are rated on a 5-point scale ranging from 1 (*definitely does not apply*) to 5 (*definitely applies*).

STRS scores as assessed in general education were derived from the Dutch STRS manual (Koomen et al., 2007). The following criteria were applied in order to ensure adequacy of the data: representation of all geographic regions in the Netherlands, representation of all types of education (2.8% special education), and inclusion in the sample of at least 100 boys and 100 girls from each year of age (age range: 3-12). In all, data were collected for 1,140 boys and 1,195 girls, with a mean age of 8.1 years in 2004-2005.

Peer interactions. Children's perceptions of classroom peer interactions were assessed using the Climate in the Class subscale of the Dutch Class Climate Scale (DCCS; Donkers & Vermulst, 2014). This subscale generally measures negative events that can occur within the classroom between children (e.g., bullying behavior, children's victimization) and can be used with children in grade 2 onwards. This subscale consists of 8 items and is scored by children on a 4-point scale ranging from 1 (*almost never*) to 4 (*often*). Sample's Cronbach's alpha was .84. An example item is '*In my class, children are bullied.*' Scores were reversed to represent positive peer interactions.

DCCS scores from children in general education were obtained from the developers of the DCCS (Donkers & Vermulst, 2013). As these data belong to a commercial company, they could not be published and were therefore omitted from Table 2.2. However, for research purposes, we obtained and analyzed the data from 13,633 children (51% boys) in Dutch general elementary education assessed between 2009 and 2011.

Children's prosocial behavior and peer dislike. Children's prosocial behavior and peer dislike were evaluated by means of unlimited peer nominations (Coie & Dodge, 1988). Prosocial behavior was assessed using the question *'Which children in your classroom are nice to other children?'*. Peer dislike was assessed using the question '*Which children in your classroom do you like least?'*. The mean number of children providing peer nomination data in relation to each classmate was 8.92 (SD = 2.47; range: 1-13). To account for variability in classroom size, scores were adjusted by dividing each individual child's total number of nominations by the number of participating children in the class minus one (self-nominations were not allowed). To achieve percentages of prosocial behavior and peer dislike, scores were multiplied by 100.

Data from general education with regard to peer nominations were available from a large intervention study implemented in 30 general primary schools in two urban areas in the western part of the Netherlands and one rural area in the eastern part of the Netherlands (Menting, 2012). In this study, children's prosocial

behavior and peer dislike were assessed in grade 1 (2005) and every following year until grade 6 (2010). For the present study, we selected children from the control condition, who did not receive the intervention, and who participated in at least one assessment. This resulted in a sample of 317 children (47% boys). Children's mean age, averaged over the available assessments, was 8.8 years. For data comparison, we used mean scores, i.e., each child's average score over all available assessments.

Teacher competence and wellbeing. Two subscales of the Dutch adaptation of the Maslach Burnout Inventory for teachers (UBOS-L; Schaufeli & Van Dierendonck, 2000) were used. Teacher personal competence was assessed using the Personal accomplishment subscale, which has 7 items, for example *'I feel I'm positively influencing other people's lives through my work*' (sample's Cronbach's alpha .78). Teachers rated the items on a 7-point scale, ranging from 0 (*never)* to 6 (*every day*). Teacher wellbeing was assessed using the Emotional exhaustion subscale, which has 8 items, for example, '*I feel emotionally drained from my work*' (sample's Cronbach's alpha .88). Scores on this subscale were reversed to represent wellbeing.

We obtained UBOS-L scores of teachers in general education from the Dutch UBOS-L manual (Schaufeli & Van Dierendonck, 2000). The authors of this manual established the quality of these UBOS-L data by collecting a large number of samples of elementary school teachers, recruited from five different studies from various parts of the Netherlands. In total, 608 elementary school teachers were included between 1994 and 1997. Their mean age varied between the five studies from 41 to 47 years and their mean years of work experience ranged from 14 to 20 years.

Data Analysis

Analyses of variance were performed using sample size, scale means, and standard deviations of our sample and population norms. In contrast to the analysis of teacher characteristics, social classroom relationships and children's classroom adjustment were analyzed separately for boys and girls as these population-based norms are gender specific. Effect sizes were also calculated to determine whether the differences between population norms and our special education sample were clinically relevant. These were computed by dividing the mean difference in scale scores by the pooled standard deviation (Cohen's *d*), using Cohen's guidelines for interpretation (0.2 = small, 0.5 = medium, 0.8 = large; Cohen, 1992).

Results and Discussion

The mean age of our teachers was 38 years (range 23-62 years), 76% were female, and 89.5% were working full-time. The majority of children in special education were boys (87%). Children had a mean age of 10.1 years (range 5-13 years) and a mean IQ of 88 (range 56-143). Upon placement in special education, all children were diagnosed by certified mental health professionals (e.g., psychiatrists, clinical psychologists) not associated with our study. We obtained information on children's psychiatric disorders through their school medical files. Children had at least one psychiatric disorder and many children had comorbid psychiatric disorders (see Table 2.1). In addition, 47.5% of the children received individual psychiatric treatment outside the classroom and 49.6% of the children were treated with psychiatric medication.

Table 2.2 presents the means and standard deviations of children's classroom adjustment and social classroom relationships. As could be expected, children in our special education sample displayed substantially higher levels of emotional and behavioral problems than children in general education. Teachers experienced less teacher-child closeness and children experienced fewer positive peer interactions than children in general education, which is in line with previous research (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008; Hoza et al., 2005). Similarly, girls in special education were relatively more disliked than girls in general education. However, children in our sample did not score worse on all measures when compared to children in general education. Specifically, child-perceived prosocial behavior of classmates was higher in special than in general education and boys in special education were - in general - less disliked than boys in general education. As peer nominations were used to assess children's prosocial behavior and peer dislike, these findings may be explained by the fact that general education classes consist of at least 2-3 times as many children than special education classes. Despite the fact that we adjusted our outcomes for class size, in such small classrooms, children most likely know each other quite well, which may explain a relatively high percentage of nominations. At the same time, the fact that boys are largely overrepresented in special education classrooms, and the fact that friendships at this age are more often with same gender peers (Östberg, 2003), explains why boys are more socially preferred by their classmates in special than in general education, whereas girls are not.

Table 2.2

Means and Standard Deviations of Social Classroom Relationships and Children's Classroom Adjustment in Special and General Education

Measures	Special education					
	male			female		
	N	*M*	*SD*	*N*	*M*	*SD*
Teacher-child relationship	355	41.23	7.39	52	43.87	5.63
Peer interactions	333	23.66	5.15	49	25.41	3.74
Prosocial behavior	345	48.08	20.98	49	50.46	22.82
Peer dislike	345	22.72	18.62	49	24.08	20.47
Emotional problems	357	2.45	0.69	52	2.38	0.58
Behavioral problems	357	2.52	0.74	52	2.17	0.78

The means and standard deviations of the teacher measures are presented in Table 2.3. In contrast to often-stated observations of high levels of teacher burnout in U.S. special education (Fore, Martin, & Bender, 2002), teachers in our special education sample did not differ from teachers in general education with regard to their reported wellbeing. Moreover, teachers rated their personal competence higher than teachers in general education. This is remarkable as teaching children with psychiatric problems is often regarded as a challenging task (Greene et al., 2002) and research has shown that children's maladjustment is related to higher levels of burnout and lower levels of perceived competence (Tsouloupas, Carson, Matthews, Grawitch, & Barber, 2010). However, classroom adaptations in segregated settings for special education, such as additional resources for teachers, special teacher training, and smaller class size (Albrecht et al., 2009; Meijer, 2003), may support teachers to meet their needs and the needs of children with psychiatric problems.

General education						F-value		Cohen's *d*	
male			female			male	female	male	female
N	*M*	*SD*	*N*	*M*	*SD*				
1140	43.80	7.21	1195	46.44	6.33	33.99*	8.29*	-0.35	-0.41
6911	.	.	6722	.	.	89.11*	2.87*	-0.49	-0.26
150	29.6	16.3	167	41.6	18.9	92.15*	7.55*	+0.94	+0.45
150	26.2	14.8	167	17.3	12.6	4.11*	8.67*	-0.20	+0.46
1805	1.85	0.64	1722	1.78	0.63	255.13*	45.99*	+0.93	+0.95
1805	2.11	0.81	1722	1.71	0.64	78.50*	25.72*	+0.51	+0.71

Note. Empty cells are scores that publisher does not allow to be printed; + = mean score is higher in special education, - = mean score is lower in special education; * = $p \leq .05$.

Table 2.3

Means and Standard Deviations of Teacher Characteristics in Special and General Education

Measures	Special education			General education			F-value	Cohen's *d*
	N	*M*	*SD*	*N*	*M*	*SD*		
Teacher competence	68	4.73	0.71	608	4.38	0.76	13.11*	+0.46
Teacher wellbeing	68	1.61	0.93	608	1.72	1.08	0.65	-0.10

Note. + = mean score is higher in special education, - = mean score is lower in special education; * = $p \leq .05$.

Chapter 3

Teacher Characteristics, Social Classroom Relationships, and Children's Social, Emotional, and Behavioral Classroom Adjustment in Special Education

This chapter is based on:
Breeman, L.D., Wubbels, T., Van Lier, P.A.C., Verhulst, F.C., Van der Ende, J., Maras, A., Hopman, J.A.B., & Tick, N.T. (2015). Teacher characteristics, social classroom relationships, and children's social, emotional, and behavioral problems in special education. *Journal of School Psychology*, Epub ahead of print.

Abstract

The goal of this study was to explore associations between teacher characteristics (i.e., competence and wellbeing), social classroom relationships (i.e., teacher-child and peer interactions), and children's social, emotional, and behavioral classroom adjustment. These associations were explored at both the individual and classroom levels among 414 children with emotional and behavioral disorders placed in special education. Two models were specified. In the first model, children's classroom adjustment was regressed on social classroom relationships and teacher characteristics. In the second model, reversed links were examined by regressing teacher characteristics on social classroom relationships and children's adjustment. Results of model 1 showed that, at the individual level, better social and emotional adjustment of children was predicted by higher levels of teacher-child closeness and better behavioral adjustment was predicted by both positive teacher-child and peer interactions. At the classroom level, positive social classroom relationships were predicted by higher levels of teacher competence, which in turn were associated with lower classroom levels of social problems. Higher levels of teacher wellbeing were directly associated with classroom adaptive and maladaptive child outcomes. Results of model 2 showed that, at the individual and classroom levels, only the emotional and behavioral problems of children predicted social classroom relationships. At the classroom level, teacher competence was best predicted by positive teacher-child relationships and teacher wellbeing was best predicted by classroom levels of prosocial behavior. We discuss the importance of positive teacher-child and peer interactions for children placed in special education and suggest ways of improving classroom processes by targeting teacher competence.

Introduction

From a developmental systems perspective, information on all dynamic classroom processes is needed to understand children's social, emotional, and behavioral classroom adjustment (Lerner, 2006; Pianta, Hamre, & Stuhlman, 2003). Pianta et al. (2003) stated that next to children's and teachers' demographic attributes and characteristics, children's social, emotional, and behavioral adjustment in the classroom is mainly the result of the reciprocal interplay between social interactions such as teacher-child and peer interactions. Although it is important to understand this dynamic interplay of classroom processes, most research has focused solely on the impact of teacher characteristics, teacher-child relationships, or peer interactions when examining children's classroom adjustment. Likewise, although classroom processes may differently impact individual children compared to the class as a whole (Morin, Marsh, Nagengast, & Scalas, 2014), there is not much research examining the impact of classroom processes at both the individual and classroom levels. Finally, although children with severe emotional and behavioral disorders (EBD) placed in special education may have more to gain from positive classroom interactions than children in general education, most research on classroom processes has been conducted in general education. Therefore, the goal of this study was to advance knowledge on classroom processes in special education by examining the associations between teacher characteristics, social classroom relationships, and children's adjustment at both the individual and classroom levels in a sample of children with EBD placed in special education.

Social Classroom Relationships and Children's Adjustment

It has been widely acknowledged that the teacher-child relationship plays an important role when it comes to children's social, emotional, and behavioral adjustment. From an attachment perspective, it has been proposed that children who develop secure attachments with parents will also develop more positive teacher-child relationships, which may increase their classroom psychosocial adjustment (Verschueren & Koomen, 2012). Empirical studies have indeed shown that a positive teacher-child relationship is associated with a variety of positive child outcomes such as the development of children's social skills (Cornelius-White, 2007), children's psychosocial adjustment in school (Buyse, Verschueren, Verachtert, & Van Damme, 2009), and children's school motivation (Maulana, Opdenakker, Den Brok, & Bosker, 2011). In addition, a negative teacher-child relationship is also associated

with undesirable outcomes such as peer dislike (Hughes, Cavell, & Willson, 2001), loneliness and depression (Maldonado-Carreño & Votruba-Drzal, 2011), and disruptive student behavior (Hamre, Pianta, Downer, & Mashburn, 2008; Spilt, Koomen, & Thijs, 2011). Next to teacher-child interactions, peer relationships may also impact children's classroom adjustment as these friendships provide children with a social mirror that is used to validate their developing self-image (Gifford-Smith & Brownell, 2003). Studies have demonstrated that especially negative peer interactions impact children's social, emotional, and behavioral classroom adjustment. For example, children's victimization by peers in the classroom has been associated with emotional problems such as anxiety and depression (Snyder et al., 2003; Vuijk, Van Lier, Crijnen, & Huizink, 2007), behavioral problems such as antisocial and aggressive behavior (Snyder et al., 2003), and social problems such as loneliness (Ladd, Kochenderfer, & Coleman, 1997).

However, it is important to note that because classroom processes are dynamic, associations may be bidirectional. Therefore, children's classroom adjustment, such as prosocial and antisocial behaviors, may also impact the development of social relationships in the classroom. For example, longitudinal studies suggest that children's aggressive behavior increases future peer rejection and reduces future teacher preference (Mercer & DeRosier, 2008). Similarly, children who show more externalizing behaviors may be less preferred by peers in the next school year (Leflot, Van Lier, Verschueren, Onghena, & Colpin, 2011). It is thus important to study these associations in both directions.

Teacher Characteristics and Children's Adjustment

Given that social classroom relationships are important for children's classroom adjustment and that teachers can be considered authority figures who have a responsibility in facilitating these positive interactions, it is important to include teacher characteristics when examining classroom processes. For example, a lack of teacher competence may hamper a teacher's attempts to provide necessary care and education, which may directly impact children's classroom adjustment (Sutherland, Lewis-Palmer, Stichter, & Morgan, 2008). A lack of teacher competence may also indirectly affect children's classroom adjustment as teacher's emotional competence may affect the emotional support they provide to their students and thus teacher-child relationship quality (Brown, Jones, LaRusso, & Aber, 2010; Tom, 2012), which in turn may impact children's adjustment (Buyse et al., 2009; Hughes et al., 2001; Maldonado-Carreño & Votruba-Drzal, 2011; Hamre et al., 2008).

Likewise, teacher stress may also be both directly and indirectly related to classroom adjustment of children such as the level of teacher-perceived classroom behavioral problems. Directly because teachers' stress levels may affect teachers' experience of a child's behavior and thus their report on the child's behavior. For example, stress reductions in teachers have shown to heighten tolerance levels for disruptive classroom behavior (Barbaresi & Olson, 1998). With regard to indirect effects, the lower teachers' stress levels and the higher their tolerance levels tend to be, the less critical and punitive they are towards children (Clunies-Ross, Little, & Kienhuis, 2008), which may lead to the formation of close instead of conflictual teacher-child relationships (Yoon, 2002). Close relationships may in turn decrease existing adjustment problems (Leflot et al., 2011; Mercer & DeRosier, 2008).

Thus, teachers' sense of competence and wellbeing may be directly and indirectly associated with children's classroom adjustment through their influence on social classroom relationships and in particular the establishment of a positive teacher-child relationship. Yet, children's classroom behavior, especially in special education, may also impact teachers' outcomes directly. Children with EBD often show out-of-seat behavior, verbal disruptions, and aggressive behavior that disrupts the educational process and which may increase teachers' stress levels (Greene, Beszterczey, Katzenstein, Park, & Goring, 2002). Both children's externalizing behavior and teacher stress may result in reduced levels of teachers' self-efficacy in teaching (Friedman, 2000) and may also lead to reduced wellbeing because of increased burnout symptoms (Maslach, Schaufeli, & Leiter, 2001). In addition, the impact of children's behavior on teacher outcomes may be mediated by classroom social relationships as disrupting the educational process may cause more teacher-child conflict (Hamre et al., 2008) and negative peer interactions (Gifford-Smith & Brownell, 2003), which may lead to lower teacher wellbeing (Spilt et al., 2011; Yoon, 2002) and lower sense of competency in teaching (Spilt et al., 2011; Yeo, Ang, Chong, Huan, & Quek, 2008).

Advancing Research on Classroom Processes

Although numerous studies have focused on classroom processes and how they affect child outcomes, a number of limitations are present in these studies that may restrict the validity or generalizability of the described results. First, with some positive exceptions, such as studies by Mercer and DeRosier (2008) and Leflot et al. (2011), many studies focus on either the impact of teacher-child interactions in the classroom (e.g., Buyse et al., 2009; Downer, Sabol, & Hamre, 2010; Maldonado-Carreño & Votruba-Drzal, 2011) or on the impact of classroom peer interactions

(e.g., Ladd et al., 1997; Snyder et al., 2003) on children's classroom adjustment. However, from a developmental systems perspective, all these processes are interrelated (Pianta et al., 2003) and studies that integrate multiple classroom processes should therefore go beyond testing bivariate associations and focus on possible mediational mechanisms (Downer et al., 2010). On a related matter, many previous studies used solely teacher ratings on both social classroom interactions and children's adjustment (e.g., Buyse et al., 2009), which may have led to shared method variance that may possibly account for some of the effects found in these studies. Therefore, it is recommended to use multiple informants on classroom processes (Mashburn, Hamre, Downer, & Pianta, 2006; Sabol & Pianta, 2012). This study will therefore integrate the analysis of multiple classroom processes (i.e., teacher characteristics, teacher-child and peer interactions, and children's classroom adjustment) to examine the unique direct and indirect contributions of each of these constructs on each other, using both teacher and peer ratings of classroom processes.

Second, when integrating multiple classroom processes, it is important to examine these processes both at the individual and classroom levels, because teacher-child and peer interactions may differently impact individual children compared to the class as a whole and associations at the individual level may have a distinct meaning from these associations at the classroom level (Downer et al., 2010; Morin et al., 2014; Pianta et al., 2003). For example, a teacher may affect children individually, through his or her personal relationship with specific children. Yet, it is also possible that a teacher's closeness or friendliness is a more global teacher characteristic or interpersonal style (Wubbels & Brekelmans, 2005), which is shared by all children in class and consequently affects classroom level outcomes. Thus, to obtain a proper insight into classroom dynamics, this study will examine classroom processes in a multilevel context.

Third, most studies have focused on classroom processes in general education; however, classroom processes may interact differently in special education where children with EBD are educated. Children with EBD develop more dissatisfaction in their teacher-child relationships (Murray & Greenberg, 2001), collaborate less with their teachers (Toste, Bloom, & Heath, 2014), and encounter more peer victimization (Little & Kobak, 2003) than children without EBD and these negative social experiences may in turn lead to poor classroom adjustment (Sabol & Pianta, 2012). These findings are especially important because children with EBD not only experience more negative interactions, they may also, in line with Belsky's (1997) differential susceptibility hypothesis, be more susceptible to positive and negative

social interactions. Many studies have provided evidence for Belsky's theory that children with a difficult temperament are particularly susceptible to the care they receive. Specifically, less emotional support from teachers (Downer et al., 2010) and low quality childcare (Pluess & Belsky, 2009) have been shown to exacerbate social dysfunction in socially and behaviorally at-risk children. Likewise, teacher-child closeness (Baker, 2006; Silver, Measelle, Armstrong, & Essex, 2005; Berry & O'Conner, 2010) and high-quality childcare (Pluess & Belsky, 2009) especially benefited children with social, emotional, and behavioral problems.

The Present Study

In this study, we examined associations between teacher characteristics, social relationships, and children's classroom adjustment in a population of children with EBD who have various psychiatric diagnoses and are therefore placed in special education. We aimed to overcome the limitations of previous studies by including measures of both teacher-child and peer interactions, using ratings of multiple informants, and applying multilevel analyses. To identify central associations between these classroom processes, we applied multilevel structural equation modeling using a cross-sectional design. As the associations between the study variables are likely bidirectional and as our design prohibits drawing conclusions on the direction of effects, we examined two models to provide a comprehensive overview of all associations. The first model focuses on predicting child outcomes and the second model on predicting teacher outcomes. With regard to child outcomes, we tested two hypotheses. First, we expected children's social, emotional, and behavioral adjustment to be predicted by teacher-child and peer interactions (Buyse et al., 2009; Hughes et al., 2001; Ladd et al., 1997; Maldonado-Carreño & Votruba-Drzal, 2011; Snyder et al., 2003) at both the individual and classroom levels. Second, we expected classroom levels of children's adjustment to be predicted by teacher competence and wellbeing (Barbaresi & Olson, 1998; Clunies-Ross et al., 2008; Sutherland et al., 2008). Third, with regard to teacher outcomes, we expected teacher competence and wellbeing to be predicted by classroom levels of children's adjustment (Friedman, 2000; Greene et al., 2002; Maslach et al., 2001). Fourth, we expected teacher competence and wellbeing to be predicted by social classroom relationships (Spilt et al., 2011; Yeo et al., 2008; Yoon, 2002). Fifth, with regard to social classroom relationships, we expected teacher-child and peer interactions to be predicted by children's classroom adjustment (Leflot et al, 2011; Mercer & DeRosier, 2008) at both the individual and classroom levels. Finally, we expected teacher-child and peer interactions to be predicted by teacher competence and wellbeing (Brown et al., 2010; Chang, 2009; Tom, 2012; Yoon, 2002).

Methods

In the Netherlands, the criteria for a child's inclusion in a segregated setting for special education for children with severe EBD are as follows: a psychiatric diagnosis, behavioral problems at school and at home or in the community, and limited participation in education as a result of the child's emotional and behavioral problems (Landelijke Commissie Toezicht Indicatiestelling, 2006; Meijer, 2003). Participants in this study came from 11 schools for special primary education for children with psychiatric disorders located throughout the Netherlands. All children in grades 1-6 attending one of these segregated settings at the start of the study were eligible for inclusion. The principals of 3 of these schools decided that, in total, six classes should not be able to participate in the study due to problems present in these classes such as teachers recently having resigned or experiencing burnout problems. After the exclusion of these six classes, 68 teachers gave their written informed consent. As a result, our target population consisted of 492 children taught by 68 teachers. Of those, 56 teachers were selected for this study because they could be considered the main teacher who taught children most days of the week. These teachers (76% women; mean age = 38.0 years (range 23-62 years) 89.5% working full-time) completed questionnaires about the children and themselves. Written informed parental consent for participation in the study was obtained for 84% of the children, so our final sample consisted of 414 children. These children (87% boys) had a mean age of 10.1 years (range 5-13 years) and a mean IQ of 88 (range 56-143). Upon placement in special education, all children were diagnosed by certified mental health professionals (e.g., psychiatrists and clinical psychologists) not associated with our study. We obtained information on children's psychiatric disorders through their school medical files. All children had at least one psychiatric disorder and many children had comorbid psychiatric disorders. In addition, 47.5% of the children received individual psychiatric treatment outside the classroom and 49.6% of the children were treated with psychiatric medication. This study was approved by the Dutch Medical Ethics Committee for Mental Health Care.

Measures

Data were collected 6 to 10 weeks after the start of the 2010-2011 school year. A research protocol was written on the administration of each questionnaire. In addition, approximately one month before the data assessments, research assistants received a group training session offering guidance on administering

each questionnaire and dealing with common classroom situations and questions of teachers and children. Questionnaires were completed individually in class by teachers, children, and their classmates. Given their young age, with literacy and writing skills still in development, children in grade 1 (3% of the children) did not provide self-report data. If a child in grade 2 or higher needed help to provide self-report data, separate appointments were made so that research assistants could conduct a face-to-face interview with the child to obtain data.

Teacher personal competence and wellbeing. Two subscales of the Dutch adaptation of the Maslach Burnout Inventory (MBI) for teachers (UBOS-L; Schaufeli & Van Dierendonck, 2000) were used. Teachers rated the items on a 7-point scale, ranging from 0 (*never)* to 6 (*every day*). Teacher personal competence was assessed using the Personal Accomplishment subscale, which has 7 items (e.g., '*I feel I'm positively influencing other people's lives through my work*'). The sample's Cronbach's alpha was .78. Teacher wellbeing was assessed using the Emotional Exhaustion subscale, which has 8 items (e.g., '*I feel emotionally drained from my work*'). The sample's Cronbach's alpha was .88. Scores on this subscale were reversed to represent wellbeing. The UBOS-L is a widely used (Schaufeli, Bakker, Hoogduin, Schaap, & Kladler, 2001; Tomic & Tomic, 2008) standardized assessment of burnout symptoms comparable to the original American version of the MBI (Schaufeli & Van Dierendonck, 1993). The UBOS-L has reasonable discriminative power as the questionnaire can help discriminate individuals with and without burnout (Schaufeli et al., 2001) and has clinical value as scores can predict teachers' sick leave due to work-related psychological symptoms (Schaufeli & Van Dierendonck, 2000).

Teacher-child interactions. Teacher reports of the relationship between teachers and individual children were collected using the Closeness scale of the Dutch Student Teacher Relationship Scale (STRS; Koomen, Verschueren, & Pianta, 2007). Closeness (i.e., warm and open communication; 11 items) was measured using items such as '*I share an affectionate, warm relationship with this child*'. The sample's Cronbach's alpha was .88. Items are rated on a 5-point scale ranging from 1 (*definitely does not apply*) to 5 (*definitely applies*). Intraclass correlation coefficients (ICC) indicated that 21% of the variance in individual ratings of teacher-child closeness was at the classroom level. The STRS is a frequently used and empirically validated measure of teachers' perceived relationship quality with individual children (Sabol & Pianta, 2012). Previous studies have reported high test-retest reliability coefficients for the original (.83 within a 4-week interval; Pianta, 2001) and the Dutch version of the STRS (between .70 and .83 within a 3-4 month interval;

Koomen et al., 2007). In addition, teacher reports of teacher-child closeness, as rated by the STRS, are moderately and positively associated with closeness rated from the child's perspective (Doumen et al., 2009).

Peer interactions. Children's perceptions of classroom peer interactions were assessed using the Climate in the class subscale of the Dutch Class Climate Scale (DCCS; Donkers & Vermulst, 2014). This subscale generally measures negative events that can occur within the classroom between children (e.g., bullying behavior and children's victimization) and can be used with children in grade 2 onwards. This subscale consists of 8 items and is scored by children on a 4-point scale ranging from 1 (*almost never*) to 4 (*often*). An example item is '*In my class, children are bullied*'. The sample's Cronbach's alpha was .84. Scores were reversed to represent positive peer interactions. ICC values indicated that 21% of the variance in classroom peer interactions was at the classroom level. Donkers and Vermulst (2014) reported good content validity of the measurements as the questionnaire is constructed within the theoretical framework of class pedagogical climate (Moos, 1979) and supplemented with items that reflect the opinions of experts in the educational field. In addition, they reported evidence of internal structure from testing the instrument's factor structure extensively in a large sample of respondents. Finally, they found that the items measure the same construct in various educational settings.

Prosocial behavior and peer dislike. Children's prosocial behavior and peer dislike were evaluated by means of unlimited peer nominations (Coie & Dodge, 1988). Only children who had parental consent participated in the peer nomination procedure. All children in a class could however be nominated by the participating children, in order to not confuse the children by forcing them to nominate 'second choices.' Children who were nominated but who had no parental consent were afterwards deleted from the scoring sheets. Prosocial behavior was assessed using the question '*Which children in your classroom are nice to other children?*' Peer dislike was assessed using the question '*Which children in your classroom do you like least?*' The mean number of children providing peer nomination data in relation to each classmate was 8.92 (SD = 2.47, range = 1-13). To account for variability in classroom size, scores were adjusted by dividing each individual child's total number of nominations by the number of participating children in the class minus one (self-nominations were not allowed). To achieve percentages of prosocial behavior and peer dislike, scores were multiplied by 100. ICC values indicated that 29% of the variance in prosocial behavior and 13% of the variance in peer dislike was at the classroom level. Peer nominations are considered a valid way of assessing children's social status because the children themselves, rather than parents or

teachers, are asked to evaluate the likeability of their classmates (Diamantopoulou, Henricsson, & Rydell, 2005) and can be used with children in grade 1 onwards (Coie & Dodge, 1988). In addition, Zakriski and Prinstein (2001) found that peer nominations were meaningful and related to social adaptation and psychological and behavioral adjustment in a clinical population of children with severe emotional and behavioral problems.

Emotional and behavioral problems. Teacher ratings of children's emotional and behavioral problems were collected using the Problem Behavior at School Interview (PBSI; Erasmus Medical Center, 2000). The PBSI is a 43-item questionnaire in which children's emotional and behavioral problems are rated on a 5-point scale ranging from 1 (*never*) to 5 (*very often*). The Emotional Problems scale is composed of two subscales (Anxiety: 5 items and Depression: 7 items). The correlation between the two subscales was .64 and the sample's Cronbach's alpha of the Emotional Problems scale was .86. The Behavioral Problems scale is composed of three subscales (attention deficit/hyperactivity disorder: 8 items, oppositional defiant disorder: 7 items, and conduct disorder: 12 items). The range of correlations between the subscales was .62 to .79. The sample's Cronbach's alpha of the Behavioral Problems scale was .96. ICC values indicated that 33% of the variance in children's emotional problems and 21% of the variance in children's behavioral problems was at the classroom level. A study by Leflot et al. (2011) reported high test-retest reliability coefficients for the PBSI Behavioral problems scale (range coefficients: .66-.85 in a two-year time interval). In addition, the Emotional Problems scale is positively associated with the broadband internalizing scale (r = .55) of the Teacher's Report Form (TRF; Achenbach, 1991; Verhulst, Van der Ende, & Koot, 1997) and the Behavioral Problems scale is positively associated with the broadband externalizing scale (r = .75) of the TRF (Witvliet, Van Lier, Cuijpers, & Koot, 2010).

Children's demographic data. Children's sex (0 = boy, 1 = girl) and age were included in the analysis as confounders. These data were taken from their school medical files.

Missing Data

Missing data were minimized by having research assistants always check questionnaires when collecting them from participants. With regard to teachers' questionnaires (i.e., the UBOS-L, STRS, and PBSI), missing data ranged from 0 to 2% on the different subscales. With regard to children's questionnaires, 8% of peer interactions data and 5% of the peer nomination data were missing. However, data

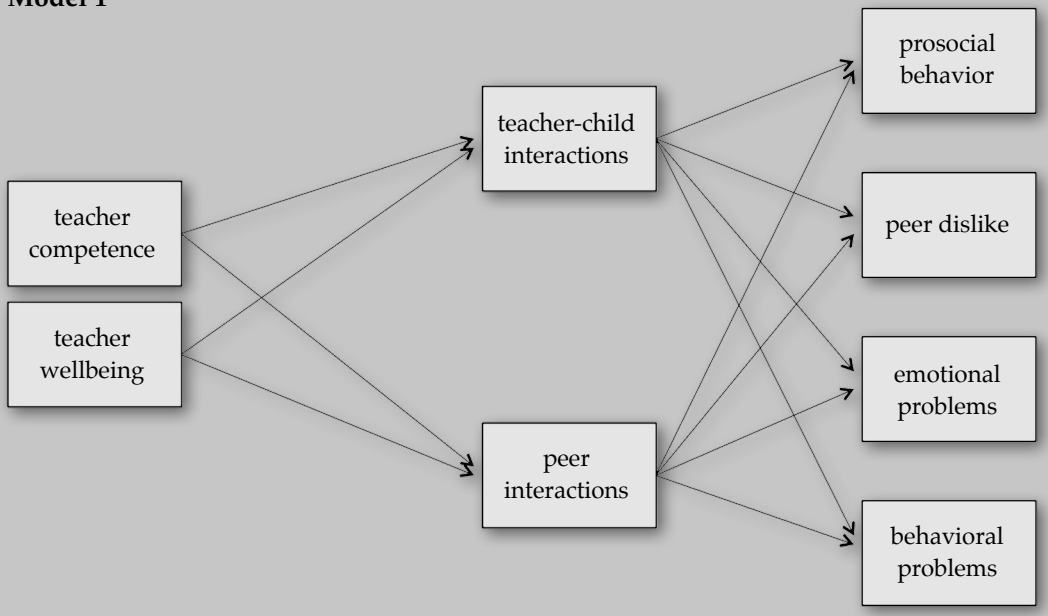
were mostly missing by design as only children from grade 2 or higher completed questionnaires. The difference in missing data between peer interactions and peer nominations measures resulted from the youngest children, who did not provide self-report peer interactions data, having older classmates (age > 7 years) that provided peer nominations data for the whole class. We used full information maximum likelihood estimation (FIML) to handle missing data because this procedure produces robust parameter estimates using all of the information available in the data (Muthén & Muthén, 1998-2010). When performing multilevel analyses, the FIML procedure has shown to perform equivalently or even better with regard to producing unbiased estimates for missing data than multiple imputation procedures (Larsen, 2011).

Data Analysis

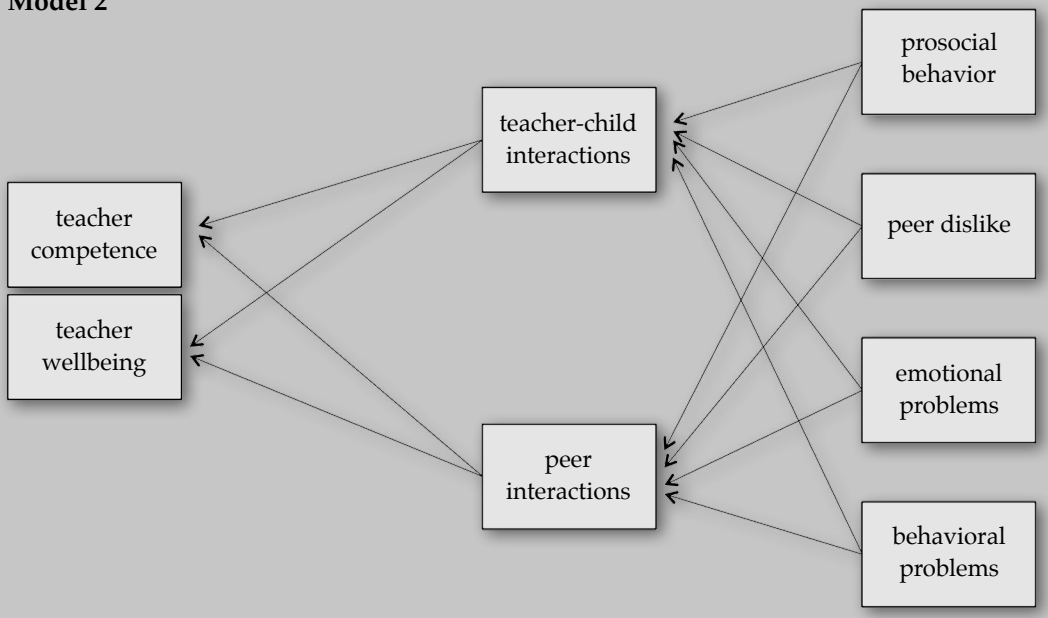
To test the associations between the study variables, two multilevel path models (see Figure 3.1) were fitted in Mplus 6.1 (Muthén & Muthén, 1998-2010) using the 'type = twolevel' command. This multilevel approach in Mplus models the dependence of children within classrooms (between level), which were identified using the 'cluster =' command. The variance was thus partitioned into individual and classroom level variance, using data available at both levels (i.e., prosocial behavior, peer dislike, emotional problems, behavioral problems, and teacher-child and peer interactions) as well as data only available at the classroom level (i.e., teacher personal competence and wellbeing as specified by the 'between =' command). Parameter estimates were computed through maximum likelihood estimation with robust standard errors (MLR). An alpha of .05 was used for all tests of statistical significance. The strength of the pathways were indicated using standardized regression coefficients which represent change in standard deviation units. Effect sizes of standardized path coefficients with values less than 0.10 indicate small effects, values around 0.30 indicate medium effects, and values around 0.50 indicate large effects (Kline, 2005). However, these guidelines can only be used on the individual level. Standardized regression coefficients on the between level, in our case the classroom level, are usually larger because they reflect aggregate level associations that often have lower measurement error than individual level associations (Muthén, 1994; Robinson, 1950). However, as not many educational studies have yet conducted multilevel structural equation modeling, empirically based general guidelines for interpreting standardized estimates on the between level are unavailable. The fit of the models to the data was assessed with the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean

Figure 3.1
Theoretical Models of Classroom Processes

Model 1



Model 2



squared error of approximation (RMSEA), and the standardized root mean square residual for within ($SRMR_w$) and between ($SRMR_b$) model fit. Fit of the models was considered good for a value of CFI and TLI equal or larger than .95, for RMSEA equal or less than .06, and SRMR equal or less than .08 (Hu & Bentler, 1999).

We analyzed our theoretical models using a two-step procedure. First, we examined the impact of children's sex and age on all outcome variables at the individual and classroom levels. When testing the impact of child demographic data, all outcome variables were allowed to be freely associated with each other. Second, we simultaneously estimated the individual and classroom level pathways in our theoretical models (see Figure 3.1). In the first model predicting child outcomes (upper part Figure 3.1), individual level child outcomes were regressed on social relationships. Classroom-level child outcomes were regressed on social relationships and teacher characteristics. In the second model predicting teacher outcomes (lower part Figure 3.1), individual level social relationships were regressed on children's adjustment. At the classroom level, teacher characteristics were regressed on social classroom relationships and children's adjustment. As teacher characteristics, such as teacher competence and wellbeing, are shared by all children in a particular class, the associations between teacher characteristics and children's outcomes can only be examined at the classroom level.

Results

We first tested the impact of sex and age on all study variables in the multilevel model. At this stage, no regression paths between the study variables were imposed, but study variables were allowed to be freely correlated with each other. As can be seen in Table 3.1, at the individual level, girls had more positive teacher-child ($\beta = 0.11$, $p = .01$) and peer interactions ($\beta = 0.06$, $p = .05$) and fewer behavioral problems ($\beta = -0.15$, $p < .01$) than boys. At the classroom level, older children showed more prosocial behavior than younger children ($\beta = 0.37$, $p = .03$). To control our path estimates for the impact of children's sex and age, we modeled these four statistically significant pathways in our subsequent models.

Next, we fitted both models in which we assumed paths from teacher characteristics to child adjustment (model 1) and from child adjustment to teacher characteristics (model 2). The fit indices of model 1, $\chi^2(16) = 19.340$, $p = .25$; CFI = .99; TLI = .96; RMSEA = .02; $SRMR_w = .02$; and $SRMR_b = .09$, and of model 2, $\chi^2(16) = 23.749$, $p = .10$; CFI = .98; TLI = .91; RMSEA = .03; $SRMR_w = .02$; and $SRMR_b$

Table 3.1

Impact of Sex and Age on the Outcome Measures

Demographic parameters	IL		CL	
	Est.	SE	Est.	SE
Sex to teacher interactions	0.11*	0.04	0.28	0.36
Sex to peer interactions	0.06*	0.03	0.66	0.35
Sex to prosocial behavior	-0.01	0.06	0.31	0.59
Sex to peer dislike	0.09	0.06	-0.67	0.72
Sex to emotional problems	-0.08	0.05	0.28	0.35
Sex to behavioral problems	-0.15*	0.05	-0.21	0.35
Sex to teacher competence	.	.	0.25	0.36
Sex to teacher wellbeing	.	.	0.11	0.33
Age to teacher interactions	0.00	0.05	-0.19	0.17
Age to peer interactions	-0.00	0.05	-0.35	0.19
Age to prosocial behavior	0.03	0.06	0.37*	0.16
Age to peer dislike	-0.03	0.06	0.29	0.28
Age to emotional problems	-0.04	0.05	-0.14	0.17
Age to behavioral problems	0.03	0.05	-0.26	0.16
Age to teacher competence	.	.	0.05	0.16
Age to teacher wellbeing	.	.	0.26	0.15

Note. All estimates are standardized estimates (β); * = $p \leq .05$; empty cells are parameters not estimated; IL = individual level; CL = classroom level; sex (0=boys, 1=girls).

= .09, suggested that the fit to the data was adequate. As models 1 and 2 were non-nested, we used three information criteria indices to compare the models: the Akaike information criterion (AIC), the Bayesian information criterion (BIC), and the sample-size adjusted BIC (corBIC), with lower values suggesting a better fit of the model to the data. The values of model 1 (AIC = 14658, BIC = 14935, and corBIC = 14716) and model 2 (AIC = 14660, BIC = 14937, and corBIC = 14718) were approximately the same (ΔAIC = 2, ΔBIC = 2, and ΔcorBIC = 2), suggesting that associations between the study variables are likely bidirectional. We therefore present results from both models.

Model 1: Associations Between Teacher Characteristics and Child Adjustment

Results of path estimates can be found in Table 3.2. At the individual level (upper part of Figure 3.2), higher levels of teacher-child closeness were associated with higher levels of prosocial behavior, less peer dislike, and fewer emotional and behavioral problems in children and these path estimates were in the small to medium range. More positive peer interactions were only associated with fewer behavioral problems in children and these estimates could be interpreted as small. The classroom level model (lower part of Figure 3.2) represents the teacher characteristics and aggregated classroom means of individual scores. Higher levels of positive classroom peer interactions were associated with classes in which children showed more prosocial behavior and less peer dislike. No associations between teachers' closeness and classroom level differences in children's social, emotional, and behavioral adjustment were found. Teacher wellbeing was directly associated with higher classroom levels of prosocial behavior and lower classroom levels of children's emotional and behavioral problems. Although teacher-rated personal competence was not directly associated with classroom level differences in children's social, emotional, and behavioral adjustment, higher levels of teacher personal competence were associated with higher classroom levels of positive teacher-child and peer interactions. Therefore, we estimated the statistical significance of indirect associations between teacher personal competence and classroom differences in children's social adjustment outcomes. Although the direct links between teacher competence and peer interactions and between peer interactions and prosocial behavior and peer dislike were statistically significant, the indirect links between teacher personal competence and prosocial behavior (β = 0.16, p = .35) and peer dislike (β = -0.33, p = .15) were not statistically significant.

Table 3.2

Model 1: Estimates of Children's Classroom Adjustment Regressed on Teacher Characteristics

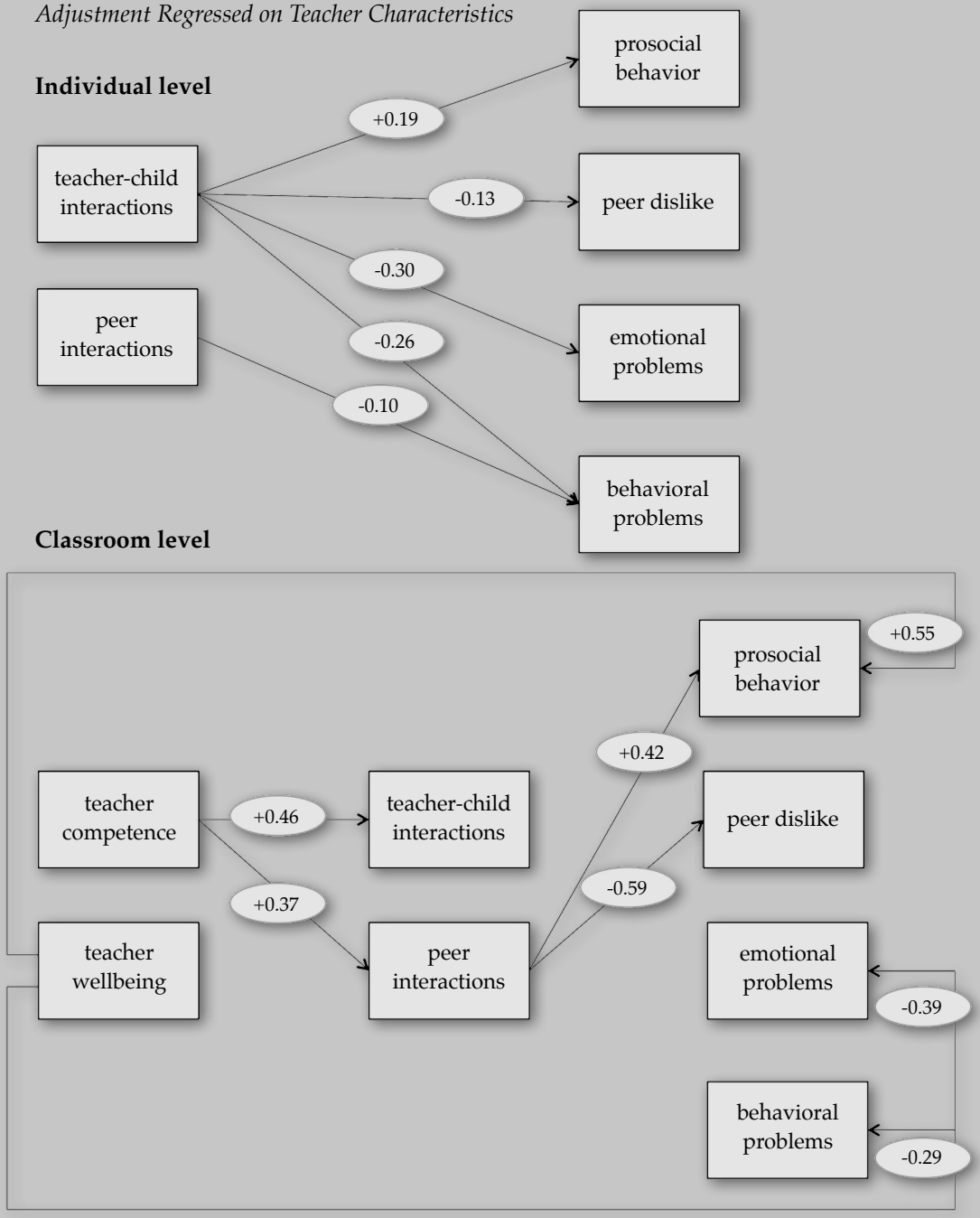
Model parameters	IL		CL	
	Est.	SE	Est.	SE
Teacher competence to teacher interactions	.	.	0.46*	0.16
Teacher competence to peer interactions	.	.	0.37*	0.16
Teacher wellbeing to teacher interactions	.	.	0.01	0.23
Teacher wellbeing to peer interactions	.	.	-0.23	0.19
Teacher interactions to prosocial behavior	0.19*	0.06	0.01	0.22
Teacher interactions to peer dislike	-0.13*	0.05	-0.24	0.30
Teacher interactions to emotional problems	-0.30*	0.06	-0.19	0.23
Teacher interactions to behavioral problems	-0.26*	0.05	-0.05	0.29
Peer interactions to prosocial behavior	0.06	0.06	0.42*	0.19
Peer interactions to peer dislike	0.04	0.06	-0.59*	0.29
Peer interactions to emotional problems	0.05	0.05	0.14	0.22
Peer interactions behavioral problems	-0.10*	0.05	-0.46	0.30
Teacher competence to prosocial behavior	.	.	-0.17	0.19
Teacher competence to peer dislike	.	.	-0.12	0.29
Teacher competence to emotional problems	.	.	-0.06	0.20
Teacher competence to behavioral problems	.	.	-0.04	0.26
Teacher wellbeing to prosocial behavior	.	.	0.55*	0.17
Teacher wellbeing to peer dislike	.	.	0.13	0.20
Teacher wellbeing to emotional problems	.	.	-0.39*	0.13
Teacher wellbeing to behavioral problems	.	.	-0.29*	0.14

Teacher competence with teacher wellbeing	.	.	0.23	0.13
Teacher interactions with peer interactions	0.06	0.07	-0.39*	0.20
Prosocial behavior with peer dislike	-0.52*	0.05	0.73	0.49
Prosocial behavior with emotional problems	-0.07	0.04	-0.16	0.24
Prosocial behavior with behavioral problems	-0.39*	0.04	0.09	0.31
Peer dislike with emotional problems	0.15*	0.05	-0.08	0.32
Peer dislike with behavioral problems	0.25*	0.06	-0.02	0.30
Emotional problems with behavioral problems	0.16*	0.07	0.81*	0.13
Sex to teacher interactions	0.12*	0.04	.	.
Sex to peer interactions	0.07*	0.03	.	.
Sex to behavioral problems	-0.13*	0.04	.	.
Age to prosocial behavior	.	.	0.34*	0.17

Note. All estimates are standardized estimates (β); * = $p \leq .05$; empty cells are parameters not estimated; IL = individual level; CL = classroom level; sex (0=boys, 1=girls).

Figure 3.2

Multilevel Path Model 1: Children's Classroom Adjustment Regressed on Teacher Characteristics



Note. Associations shown are standardized regression weights. Only statistically significant ($p \leq .05$) pathways are shown.

Model 2: Associations Between Child Adjustment and Teacher Characteristics

Results are depicted in Table 3.3 and in Figure 3.3. At the individual level (upper part of 3.3), more emotional and behavioral problems of children were associated with less teacher-child closeness and these path estimates were in the small to medium range. More behavioral problems of children were also associated with more negative classroom peer interactions and these estimates could be interpreted as small. At the classroom level (lower part of Figure 3.3), it was found that only higher classroom levels of children's prosocial behavior were directly associated with more teacher wellbeing. Higher classroom levels of children's emotional problems were only associated with more positive peer interactions. More positive teacher-child interactions were only associated with higher levels of teacher competence. Classroom levels of peer dislike and behavioral problems were not statistically significantly associated with teacher personal competence, wellbeing, or classroom interactions with teachers and peers and therefore, no statistically significant indirect links between children's classroom adjustment and teacher characteristics were found.

Discussion

The goal of the current study was to apply a developmental systems framework to obtain more insight into the dynamics of classroom processes for children with EBD in segregated settings for special education. We found that teacher-child interactions were associated with individual-level child adjustment and peer interactions with individual and classroom-level child adjustment. While teacher wellbeing was directly linked to children's adaptive and maladaptive behavior, teacher personal competence was only indirectly linked to children's outcomes through social classroom relationships.

Results Regarding Child Outcomes

As stated in our first hypothesis, we expected social classroom relationships, such as teacher-child and peer relationships, to be related to children's classroom adjustment at the individual and classroom levels. Results of our first model showed that, congruent with previous studies in general education (Buyse et al., 2009; Hughes et al., 2001; Mercer & DeRosier, 2008; Spilt et al., 2011), children who form more positive relationships with their teachers also show more positive social, emotional, and behavioral classroom adjustment. Similar to our study, in previous

Table 3.3

Model 2: Estimates of Teacher Characteristics Regressed on Children's Classroom Adjustment

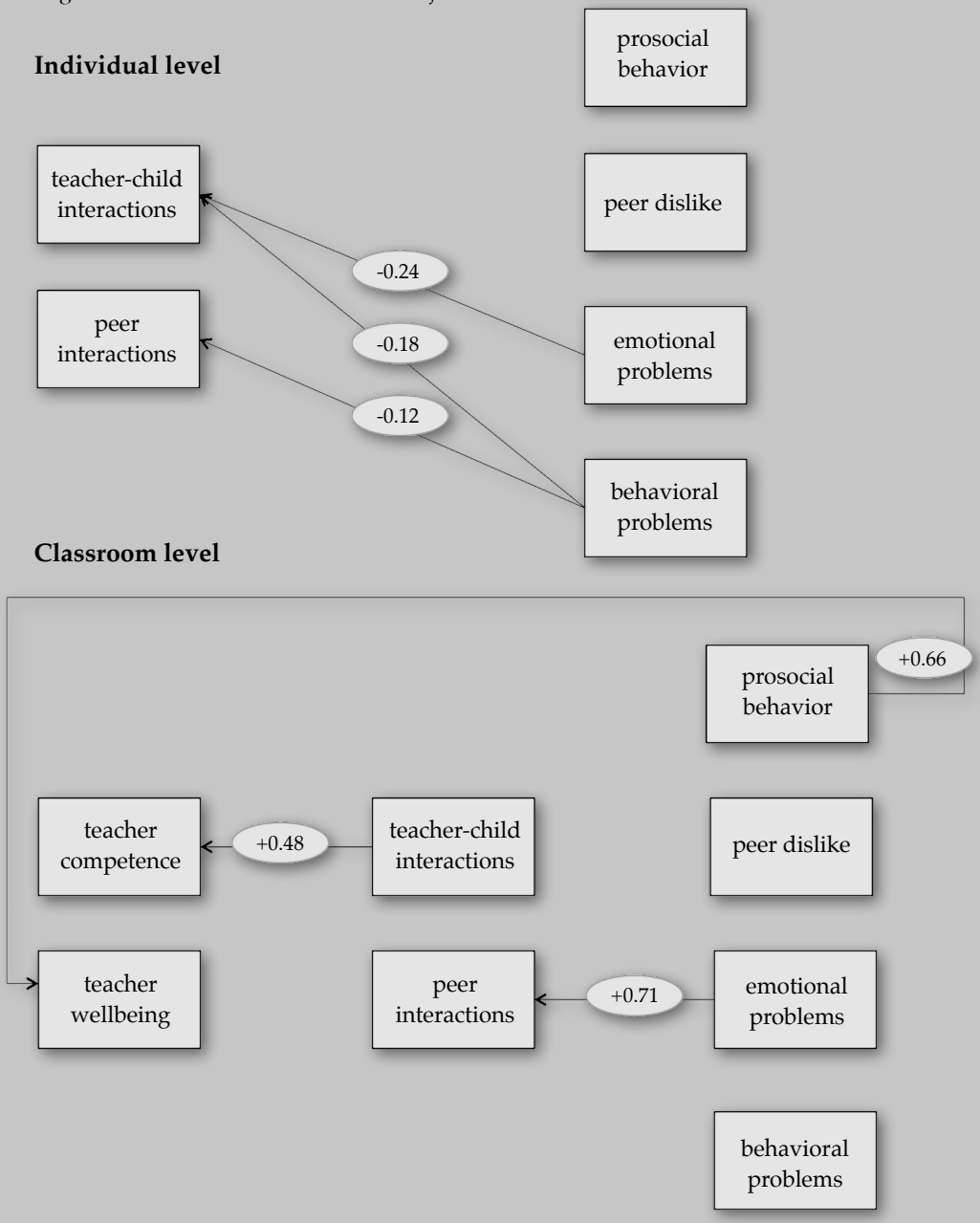
Model parameters	IL		CL	
	Est.	SE	Est.	SE
Prosocial behavior to teacher interactions	0.10	0.08	-0.13	0.28
Prosocial behavior to peer interactions	0.08	0.06	0.30	0.26
Peer dislike to teacher interactions	0.01	0.06	-0.28	0.34
Peer dislike to peer interactions	0.08	0.08	-0.40	0.37
Emotional problems to teacher interactions	-0.24*	0.06	-0.61	0.34
Emotional problems to peer interactions	0.06	0.05	0.71*	0.31
Behavioral problems to teacher interactions	-0.18*	0.07	0.40	0.42
Behavioral problems to peer interactions	-0.12*	0.06	-0.73	0.41
Teacher interactions to teacher competence	.	.	0.48*	0.17
Teacher interactions to teacher wellbeing	.	.	0.03	0.21
Peer interactions to teacher competence	.	.	0.33	0.78
Peer interactions to teacher wellbeing	.	.	-0.42	0.79
Prosocial behavior to teacher competence	.	.	0.16	0.33
Prosocial behavior to teacher wellbeing	.	.	0.66*	0.32
Peer dislike to teacher competence	.	.	-0.22	0.51
Peer dislike to teacher wellbeing	.	.	-0.33	0.47
Emotional problems to teacher competence	.	.	-0.18	0.76
Emotional problems to teacher wellbeing	.	.	-0.20	0.74
Behavioral problems to teacher competence	.	.	0.10	0.81
Behavioral problems to teacher wellbeing	.	.	-0.02	0.77

Teacher competence with teacher wellbeing	.	.	0.17	0.26
Teacher interactions with peer interactions	0.05	0.06	-0.07	0.52
Prosocial behavior with peer dislike	-0.52*	0.05	0.23	0.25
Prosocial behavior with emotional problems	-0.12*	0.04	-0.23	0.15
Prosocial behavior with behavioral problems	-0.42*	0.04	-0.25	0.19
Peer dislike with emotional problems	0.18*	0.05	-0.12	0.27
Peer dislike with behavioral problems	0.26*	0.06	0.26	0.21
Emotional problems with behavioral problems	0.22*	0.07	0.65*	0.13
Sex to teacher interactions	0.08	0.04	.	.
Sex to peer interactions	0.05	0.04	.	.
Sex to behavioral problems	-0.15*	0.04	.	.
Age to prosocial behavior	.	.	0.33	0.20

Note. All estimates are standardized estimates (β); * = $p \leq .05$; empty cells are parameters not estimated; IL = individual level; CL = classroom level.

Figure 3.3

Multilevel Path Model 2: Teacher Characteristics Regressed on Children's Classroom Adjustment



Note. Associations shown are standardized regression weights. Only statistically significant ($p \leq .05$) pathways are shown.

studies in general education, reported effect sizes regarding associations between teacher-child closeness or teacher support and children's social, emotional, and behavioral adjustment were in the small to medium range (Buyse et al., 2009; Hughes et al., 2001; Mercer & DeRosier, 2008). Although we must keep in mind that our results come from a cross-sectional study, these findings do further support the notion suggested in previous studies that teacher-child closeness is important for the emotional and behavioral adjustment of children, especially for those who are coping with numerous behavioral problems (Buyse et al., 2008; Hamre et al., 2008), as was the case in our sample. It is important to note that we found such associations only at the individual level. Differences between classes in aggregated levels of teacher-child closeness were not associated with classroom level differences in children's adjustment. Thus, the individual relationship that a teacher has with a student seems more important for a child's outcomes than teachers' general friendliness or general positive attitude towards the children in the class.

Next, the fact that we found children's individual perceptions of peer interactions to be related only to behavioral problems but not to other adjustment aspects suggests that at the individual level, children who show more behavioral problems experience their classroom peer environment as more hostile. Future studies will have to investigate whether these children victimize other children or are being victimized themselves. However, aggregated scores of classroom peer interactions (i.e., mean classroom peer interactions), as rated by the whole class, were not associated with classroom levels of children's behavioral adjustment but were only related to their social adjustment such as prosocial behavior and the presence or absence of peer dislike. Because peer interactions at the classroom level, in contrast to the individual level, were one of the strongest predictors of children's adjustment problems, peer interactions probably may be best regarded as a typical classroom characteristic. Our results suggest that, consistent with studies conducted with children in general education (e.g., Vuijk et al, 2007), interventions aimed at improving peer interactions in the classroom may impact the social adjustment of the classroom as a whole.

With regard to our second hypothesis, the fact that teacher competence was not directly related to classroom levels of children's social, emotional, and behavioral problems indicates that targeting teacher competence may improve classroom levels of social interactions but will not be directly beneficial for children. In contrast, teacher wellbeing showed direct associations with higher classroom levels of prosocial behavior and lower classroom levels of children's emotional and behavioral problems. A possible pathway to target classroom levels of children's

social, emotional, and behavioral adjustment may thus be by enhancing teacher wellbeing, for example, by implementing school-wide positive behavior support strategies (Ross, Romer, & Horner, 2012).

Results Regarding Teacher Outcomes

As stated in our third and fourth hypotheses, we expected teacher characteristics to be predicted by children's adaptive and maladaptive classroom adjustment and by social classroom relationships. Findings from our second model show that teacher wellbeing was best predicted by classroom levels of children's prosocial behavior. This finding is important because many studies focus on negative instead of positive dimensions of children's classroom adjustment, such as children's social, emotional, and behavioral problems when examining teacher wellbeing (Greene et al., 2002; Maslach et al., 2001). In addition, results from models 1 and 2 indicate that low levels of teacher wellbeing may both predict and result from dealing with classes with children showing higher levels of adjustment problems. However, because we used a cross-sectional design, examining the causal dynamics remains a topic for future longitudinal studies. Consistent with findings by Spilt et al. (2011), results in model 2 show that teacher competence was best predicted by positive teacher-child interactions. Although expected, no mediating mechanisms were found in predicting teacher outcomes. As not many facets of classroom social relationships and children's classroom adjustment predicted teacher wellbeing and competence, other factors, such as teacher's workload and administrative duties (Kokkinos, 2007; Male & May, 1997) and personality characteristics such as neuroticism (Cano-Garcia, Padilla-Munoz, & Carrasco-Ortiz, 2005; Kokkinos, 2007), should be taken into account when focusing on teacher outcomes in special education in future studies.

Results Regarding Social Classroom Relationships

Our fifth hypothesis stated that social relationships in the classroom would be predicted by children's adjustment. Congruent with the results of several studies conducted with children in general education settings (Buyse et al., 2008; Mercer & DeRosier, 2008; Nurmi, 2012) at the individual level, we found close teacher-child relationships to be most strongly associated with better behavioral and emotional adjustment rather than with a child's prosocial behavior or being disliked by peers. The fact that our findings highlighted that emotional problems were also clearly associated with classroom social relationships may be important for future research as most of the previous studies in general education have primarily focused on the

impact of behavioral problems on the formation of teacher-child relationships (e.g., Doumen, Verschueren, Buyse, Germeijs, & Luyckx, 2008; Greene et al., 2002; Hamre et al., 2008). Moreover, although some studies in general education examined the impact of teacher-child closeness on children with internalizing problems (e.g., Baker, 2006), with some exceptions (Buyse et al., 2008; Mercer & DeRosier, 2008), few studies have taken the other direction into account (e.g., the impact of symptoms of depression and anxiety in children on the formation and development of the teacher-child relationship). Yet, our results suggest that emotional problems may play a role in this development, as we found that teacher-child closeness was predicted by both emotional and behavioral problems. It was however surprising that, at the classroom level, we did not find children's emotional and behavioral problems to be associated with general teacher's friendliness towards the class. In sum, it seems that teacher-child closeness is more indicative of the classroom adjustment of individual children than of general problem-levels in the classroom. It is possible that this result is specific to special education for children with highly varying levels of social, emotional, and behavioral problems. Future research will have to further examine this possibility by replicating research in both special and general education settings.

Likewise, in line with studies conducted in general and special education (Little & Kobak, 2003; Snyder et al., 2003; Vuijk et al., 2007) model 2 shows that individual negative peer interactions were best predicted by children's emotional problems. In contrast to previous findings, we found no association between behavioral problems and peer interactions; however, this association just fell short on reaching the $p \leq .05$ criterion. Although it was expected that higher levels of children's emotional problems would lead to more negative peer interactions, the findings from the current study suggest that higher classroom levels of emotional problems were associated with more positive peer interactions. This result indicates that although emotional problems are undesirable for individual children as they are associated with more peer victimization, in classrooms with children with high levels of depression and anxiety, it appears that classroom levels of peer victimization are lower. Although this finding may seem somewhat puzzling at first, it indicates that an individual child with emotional problems may be more likely to get victimized in the classroom than a child with fewer emotional problems. However, when more children in the classroom show emotional problems, peer victimization is less likely to occur. The results of our study thus suggest that children who cope with high levels of emotional problems may feel safer in special educational settings among children who also cope with emotional problems.

The finding in model 1 that both closer teacher-child and peer relationships were predicted by higher levels of teacher competence partially supports our sixth hypothesis. This finding is important because it indicates that teachers' self rating of their competence is related not only to their experience of social classroom relationships but also to children's experience of the peer dynamics in their classroom as indicated by peer-rated peer interactions. These results are consistent with the findings of Hastings and Bham (2003) that showed that higher levels of teacher competence are associated with more sociable classroom behavior in general education. Teacher competence may improve social classroom relationships because competent teachers assign more value to close and personal relationship with their students (Cano-García et al., 2005) and because competent teachers actively manage peer networks in the classroom (Gest & Rodkin, 2011).

Our finding that teacher wellbeing was not associated with social classroom relationships contrasts with results from studies in general education. Findings from these studies suggest that higher levels of burnout problems in teachers are associated with a more negative teacher evaluation of children (Mashburn et al., 2006) and attributing little value to their relationships with students (Cano-García et al., 2005). We expected such a relationship because teachers who experience low levels of wellbeing because they feel emotionally exhausted may feel incompetent about their teaching and therefore tend to withdraw from investing in the relationship with their students (Chang, 2009). However, perhaps in special education, the psychiatric problems of children - such as a diagnosis of autism spectrum disorder, attention deficit/hyperactivity disorder, and oppositional defiant disorder - indicate an inherent problem in maintaining and developing social relationships (Bellini, Peters, Benner, & Hopf, 2007; Rich, Loo, Yang, Dang, & Smalley, 2009). Such relationships may therefore be less influenced by other factors such as teacher wellbeing. Our finding is, however, congruent with the study by Brown et al. (2010) that showed that teachers' burnout experiences were not related to observed classroom quality such as the emotional support teachers gave their students. In sum, regardless whether the absence of an association between teachers' wellbeing and social relationships in class is limited to children with EBD or may also extend to children in regular education (Brown et al., 2010), our findings suggest that the quality of the social relationships of children with EBD greatly depend on their own adjustment and on the competence of the teacher in emotionally supporting these students. Yet, the wellbeing of the teacher may be less influential in establishing positive classroom relationships.

Limitations

This study had some limitations regarding the interpretation and generalization of our results that must be considered. First, the developmental systems perspective focuses on children's development over time. However, our cross-sectional data do not allow us to draw conclusions regarding the development of children and the direction of effects. As the tested models were also statistically equivalent, evidence on the direction of effects will require further research using longitudinal designs. However, because classroom processes may reciprocally influence each other (Leflot et al., 2011; Mercer & DeRosier, 2008; Pianta et al., 2003), we examined all associations bidirectionally. Second, it is unclear to what extent our results can be generalized directly to special education for children with psychiatric problems in other countries as special education policies for children with psychiatric disorders and additional special educational needs vary worldwide (European Agency for Development in Special Needs Education, 2010; Meijer, 2003). Third, the fact that six teachers did not participate in our study merits some attention because some of these teachers were not included as a result of serious burnout problems. Given that teacher wellbeing was a construct of interest, the fact that these teachers did not participate may have influenced our results.

In addition, this study had some methodological and analytical limitations. First, demographic attributes may serve as facilitators or impediments to social classroom relationships (Downer et al., 2010), however the complexity of the analyses in combination with the limited number of teachers in this study prohibited including many demographic confounders in our model. As other demographic variables, such as teachers' sex and classroom experience, may also have an impact on classroom processes, future studies using larger samples of children and teachers in special education may be necessary to assess more possible confounders. Similarly, the complexity of the analyses and the number of teachers limited us with regard to the inclusion of other variables of interest. For example, we assessed teacher-child closeness but not teacher-child conflict. Also, we assessed only teacher emotional exhaustion as the sole indicator for teacher wellbeing. Second, information on teacher personal competence was assessed with self-ratings that may differ from observed competence ratings. However, it is likely that teachers' sense of their own competence is important for their sense of wellbeing and thereby also for the formation and development of social relationships and children's adjustment. However, socially desirable responses may have affected our outcomes. It is therefore advisable to include both self-ratings and observations of teacher competence in future research. Third, due to the relatively small number

of teachers in our sample, the only fit statistic reflecting between model fit (the $SRMR_b$; Hsu, 2009), indicated only acceptable model fit. For this reason, we caution not to overinterpret effects at the classroom level. Future studies should include replications of these findings in larger samples of children and teachers in general and special education to examine the robustness of our findings.

Practical Implications and Recommendations

Findings from this study provided a comprehensive overview of associations between teacher characteristics, social classroom relationships, and children's adjustment and additionally showed the advantage of examining classroom processes not only at the individual level but also at the classroom level. In line with a developmental systems perspective, our results suggest that some of the associations examined may be bidirectional. Therefore, a first and foremost implication of this study is the need for longitudinal studies to explore the true developmental links between the studied variables, both at the individual and at the classroom levels.

Although many of the examined associations may be bidirectional, given teachers' responsibility for children's classroom adjustment, they are important targets for implementing interventions. Such interventions should focus on the social dynamics in a classroom - between teachers and children but also between peers - to reduce negative experiences in the classroom and to create a classroom context in which children feel safe and comfortable. Practically, the results of our study suggest avenues for prevention at both the classroom and individual levels. Regarding classroom-level interventions, the results suggest that improving classroom peer interactions may improve social adjustment in children. An example of a classroom-based intervention program that has shown to be effective in this area is the Good Behavior Game (Barrish, Saunders, & Wolf, 1969). This intervention focuses on promoting positive behaviors and children working together to achieve goals. Studies have shown that this program can be effective in improving peer relationships (Witvliet, Van Lier, Cuijpers, & Koot, 2009) and altering children's behavioral problems (Petras et al., 2008; Van Lier, Muthén, Van der Sar, & Crijnen, 2004). An additional advantage of the GBG may be that by reducing children's behavioral and emotional problems, the GBG may improve the social relationships these children have with teachers and peers. Because teachers focus on supporting desired behavior, their relationships with their students may improve (Leflot, Van Lier, Onghena, & Colpin, 2010). Research is needed to establish whether this

intervention can also play a part in improving social interactions in the context of special education.

Regarding the individual level, results of our study suggest that in special education settings, it is important to focus on the dyadic relationship between children and their teachers in order to advance children's social, emotional, and behavioral adjustment. A teacher intervention that focuses on positive dyadic relationships - such as 'Banking Time' (Driscoll & Pianta, 2010) - may be suitable to enhance children's classroom adjustment. Banking Time entails creating time and opportunities for teachers' positive interactions with a specific child on a daily basis and has been shown to reduce children's conduct problems (Driscoll & Pianta, 2010). This intervention may thereby breach a negative reciprocal pattern of deteriorating teacher-child interactions and increasing maladaptive classroom adjustment of children that are fueled by reactive teacher strategies such as punishment, instead of proactive teacher strategies such as positive reinforcement (Clunies-Ross et al., 2008). This strategy in turn may increase teacher wellbeing directly and improve teacher competence indirectly by promoting the development of positive social relationships. A potential by-product of interventions such as Banking Time and the Good Behavior Game might be their positive contribution to teachers' competence by offering them guidance on handling disruptive behaviors in class and engaging in positive interactions. Taken together, classwide and individual interventions that provide teachers with practical training in improving social classroom relationships may both contribute to teacher wellbeing and competence and social, emotional, and behavioral adjustment in vulnerable children.

Chapter 4

Developmental Links between Disobedient Behavior and Social Classroom Relationships in Boys with Psychiatric Disorders in Special Education

This chapter is based on:
Breeman, L.D., Van Lier, P.A.C., Wubbels, T., Verhulst, F.C., Van der Ende, J., Maras, A., Hopman, J.A.B., & Tick, N.T. (2014). Developmental links between disobedient behavior and social classroom relationships in boys with psychiatric disorders in special education. *Journal of Abnormal Child Psychology*, Epub ahead of print.

Abstract

In general education, positive relationships with teachers and peers have been found to positively influence children's behavioral development. However, high levels of classroom behavioral problems may hinder the formation of such positive relationships. Therefore, findings from general education cannot be generalized to special education. The present study investigated the developmental links between disobedience and positive as well as negative relationships with teachers and peers among boys in restrictive special education settings. At three assessment waves across one school year, teacher-reports of teacher-child closeness and conflict and peer-reports of peer acceptance, rejection, and disobedience were collected among 340 boys (mean age = 10.1 years, *SD* = 1.58, range = 5-13) with psychiatric disorders receiving special education. Autoregressive cross-lagged models were fitted to explore the nature of these developmental links. The impact of boys' age was examined using multiple group analyses. Findings supported the importance of teacher-child conflict, but not closeness, and positive and negative peer relationships for the development of boys' disobedience, with a stronger effect of negative than positive relationships. However, teacher-child and peer relationships were not longitudinally related and the effect of boys' age was minimal. This study extends prior research by suggesting that, despite differences in educational setting and severity of behavioral problems between children in general and special education, reducing negative classroom interactional patterns is most important in preventing the development of problematic classroom behavior in boys with severe social-emotional and behavioral difficulties.

Introduction

In general education, teacher-child and peer relationships have consistently been identified as key factors for the social and behavioral development in children (Ladd, 1990; Sabol & Pianta, 2012). However, 1 to 5% of children in western nations, such as the U.S. or European countries, are placed in segregated settings for special education (Meijer, 2003; U.S. Department of Education, 2009). One reason why children are placed in such settings is because of their special educational needs related to disabilities associated with severe social-emotional or behavioral disturbances (Stoutjesdijk & Scholte, 2009; U.S. Department of Education, 2009). The criteria for including children with psychological disabilities in self-contained special education classrooms in the Netherlands stipulate that children must have at least one psychiatric diagnosis and must show severe behavioral problems - at school and at home - that together limit their participation in general education (Ministerie OCW, 2003). The specific psychiatric problems of children in special education - mainly boys diagnosed with attention deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), or disruptive behavior disorder (DBD; Stoutjesdijk & Scholte, 2009) - may lead them to engage in disobedient behavior such as verbal disruptions and inappropriate behavior. This behavior not only disturbs the educational process, but may also hinder the development of their social relationships with teachers and peers (Bellini, Peters, Benner, & Hopf, 2007; Rich, Loo, Yang, Dang, & Smalley, 2009). Therefore, we cannot assume that findings from general education on the links between social classroom relationships and children's behavioral development can be generalized to boys in special education. The present study contributes to knowledge on developmental links between disobedience and social classroom relationships of boys with psychiatric disorders in segregated settings for special education.

Links between Disobedient Behavior and Social Classroom Relationships

Although it has been widely acknowledged that positive social relationships with teachers and peers are important for children's behavioral development, the theoretical and empirical evidence is less clear when it comes to the direction of effects. From an attachment perspective, it can be assumed that children develop internal working models of the social world and themselves, based on their relationships with adult caregivers, and apply these attachment-related expectations to future social interactions (Bowlby, 1969/1982). Children with

secure attachments may therefore develop more positive social relationships with their teachers than children who are insecurely attached (Verschueren & Koomen, 2012). Consistent with this theory, empirical work indicates that the more securely attached children are to their teacher, the less externalizing and aggressive problems they will exhibit (Baker, 2006; Hughes, Cavell, & Jackson, 1999), which suggests that teacher-child closeness reduces children's behavioral problems. However, from the teacher's perspective, behavioral problems such as disobedience and provoking confrontations represent a major challenge (Hamre, Pianta, Downer, & Mashburn, 2008). As might be expected, studies in general education have shown that children's externalizing behavior negatively influences teacher-child closeness and conflict which in turn increases children's externalizing behavior (De Laet et al., 2014; Doumen et al., 2008; Mercer & DeRosier, 2008). These findings suggest that children with behavioral problems may get caught in a vicious cycle of negative interactions.

Besides teachers, peers also impact children's behavior. Children's friendships with peers differ from teacher-child relationships in a sense that peers provide a social mirror that is used to validate a child's developing self-image (Gifford-Smith & Brownell, 2003). Empirical studies have found that poor appraisal by peers predict increases in disobedient and aggressive behavior, even after controlling for both the reverse effect of children's behavior on peer rejection and prior behavioral problems (Leflot, Van Lier, Verschueren, Onghena, & Colpin, 2011; Mercer & DeRosier, 2008; Sturaro et al., 2011). It has been suggested that such behavioral reactions of children to poor appraisal by their peers are because children perceive the school environment as non-supportive (Ladd, 1990) or because of social cognitive biases such that rejected children are more likely to perceive ambiguous peer behavior as hostile and therefore may show more behavioral problems (Gifford-Smith & Brownell, 2003). However, there is also evidence of an effect in the opposite direction: the behavioral problems of children predict poor appraisal and rejection by classmates (Leflot et al., 2011; Mercer & DeRosier, 2008; Sturaro et al., 2011). This is likely because children's disobedience cause classroom disruptions which may affect all classmates (Carrell & Hoekstra, 2010) and therefore classroom climate in general. Alternatively, the children showing disobedience may be regarded by peers as less mature (Ladd, 1990) or more social naive (Rich et al., 2009) which may lead to less social acceptance.

Indirect Effects on Disobedience: Links between Social Classroom Relationships

From a developmental systems perspective, children's classroom behavior and their

classroom relationships with teachers and peers are all interrelated (Pianta, Hamre, & Stuhlman, 2003). Therefore, when examining developmental links between children's behavior and social relationships in the classroom, it is important to include both teacher-child and peer relationships to disentangle their effects on children's behavioral development and also take into account the links between teacher-child and peer relationships. Empirical studies have shown that teacher-child and peer-child relationships can reinforce one another (Hughes & Chen, 2011; De Laet et al., 2014; Leflot et al., 2011; Mercer & DeRosier, 2008). A possible explanation for the impact of the teacher-child on peer relationships comes from social referencing theory (Hughes, Cavell, & Willson, 2001), which presumes that the teacher serves as a social referent for children, thereby allowing classmates to make inferences about children's likability based on their observations of teacher-child interactions. It has indeed been found that receiving more teacher support increased the likelihood of later higher appraisal by peers (Hughes & Chen, 2011; De Laet et al., 2014; Mercer & DeRosier, 2008). However, this result was not confirmed in a study by Leflot et al. (2011). Interestingly, effects of peers on teachers are shown to be stronger and more consistent than the reverse effect of teachers on peers (Mercer & DeRosier, 2008; De Laet et al., 2014). More consistent findings showed that peer rejection reduces the support children receive from teachers two to three years later (De Laet et al., 2014; Hughes & Chen, 2011; Leflot et al., 2011; Mercer & DeRosier, 2008). It thus appears that teachers also make inferences about a child based on the child's interactions with peers, because positive peer interactions may lead to more cooperation and engagement in the classroom resulting in teachers increasingly preferring this child (Hughes & Chen, 2011; Leflot et al., 2011). Therefore, in the present study, we will examine the developmental links between teacher-child and peer relationships.

Advancing Current Knowledge:
Some Conceptual and Methodological Considerations

Several conceptual and methodological considerations need to be taken into account to advance and contribute to current knowledge on classroom processes. First, prospective instead of cross-sectional research is needed to provide evidence on the direction of effects between classroom relationships and disobedience. To establish whether these processes truly impact one another over time, developmental links should be adjusted for the impact of both stability paths and cross-sectional correlations. With some positive exceptions (De Laet et al., 2014; Doumen et al., 2008; Leflot et al., 2011; Mercer & DeRosier, 2008; Sturaro et al., 2011; Zhang &

Sun, 2011), such analyses were, until recently, rarely common practice, leading to an overestimation of developmental effects. Therefore, our study will employ autoregressive cross-lagged modeling to establish the unique contributions of children's disobedience and teacher-child and peer relationships on their future social and behavioral development.

Second, much research has been directed on the links between classroom relationships and children's behavioral development in children attending general education. Far less is known about classroom relationships and behavior in clinical samples of children with psychiatric disorders placed in special education while especially these children are at risk for experiencing low psychosocial, emotional, and behavioral adjustment after leaving school (Heijmens Visser, Van der Ende, Koot, & Verhulst, 2003). It is however premature to assume that developmental links found in general education can be generalized to children with severe social-emotional and behavioral difficulties such as children with ADHD, ASD or DBD in special education. For example, it has been found that children with severe emotional disturbances experience less affiliation and more dissatisfaction with teachers (Murray & Greenberg, 2001) and encounter more negative and less positive peer interactions at school (Little & Kobak, 2003) than children without disabilities. Likewise, children with behavior disorders collaborate less with their teachers (Toste, Bloom, & Heath, 2014) and children with ADHD and behavioral problems experience more peer rejection (Hinshaw & Melnick, 1995) than children without disabilities. Similarly, social difficulties, such as bullying and having less social support, are also found among children with autism (Humprey & Symes, 2010; Russel et al., 2012). These troublesome social experiences among children with ADHD, ASD and DBD may be problematic because positive social relationships may facilitate children's social and behavioral development whereas negative social relationships may profoundly promote maladjustment (see for a review: Sabol & Pianta, 2012). Supporting this assumption, research has shown that especially children with higher levels of behavioral problems in general education benefit from positive classroom relationships (Baker, 2006; Silver, Measelle, Armstrong, & Essex, 2005). Also, the impact of social classroom relationships may be even stronger for children in special education because class size is usually much smaller than in general education which may result in more individual teacher-child interactions and individualized attention (Little & Kobak, 2003). However, it is also possible that clinical samples of children with psychiatric disorders in special education are impacted less by social relationships than children with high levels of behavioral problems in general education. Children in special education generally have more

profound behavioral problems, both at school as well as at home, which may lead to a cascade of negative classroom interactions. The severity and complexity of children's problems in special education may therefore hamper the formation of positive relationships with teachers and peers and thereby limit the extent to which these children may benefit from positive aspects of social relationships. It is thus questionable to what extent positive and negative aspects of social relationships with teachers and peers actually affect these children's behavioral development. We therefore examine the links between disobedience and social classroom relationships among this clinical population in special education.

Third, studies may want to take into account the impact of children's age as the strength of the links between social classroom relationships and children's behavior may depend on age. Social referencing theory (Hughes et al., 2001) states that children use the teacher as a social referent for a child's likability. However, this may apply more to younger than to older children as younger children are more susceptible to teacher expectancies than older children (Kuklinski & Weinstein, 2001). As children grow older, they tend to rely more on their peers and increasingly use their peers as a reference for the development of their own identity (Gifford-Smith & Brownell, 2003). Also, behavioral problems may have less impact on the social classroom relationships of younger than older children as this behavior may be more normative and adaptive for younger children (Gifford-Smith & Brownell, 2003). As it is possible that children's age moderates the strength of the links between children's disobedience and social relationships, age-effects are examined in the current study.

Fourth, the relative influence of negative versus positive aspects of social relationships may also differently impact behavioral development. In a review by Baumeister, Bratslavsky, Finkenauer, and Vohs (2001), it is argued that from an evolutionary perspective, negative traits and relationships have a stronger impact than positive traits and relationships as individuals who attune to bad things are more likely to survive and pass on their genes. In their review, they consistently show stronger, more pervasive, and longer lasting psychological effects of negative than of positive aspects of relationships which implicates that children's disobedience may be more dependent on their negative than their positive social relationships. Indeed, a study by Ladd, Birch, and Buhs (1999) shows that teacher-child conflict and peer rejection were more important predictors of children's classroom adjustment than teacher-child closeness and peer acceptance. Also, a study by Zhang and Sun (2011) shows that teacher-child conflict was more strongly related to children's externalizing behavior than teacher-child closeness. For that

reason, we will examine two models: a positive relationships model including teacher-child closeness and peer acceptance and a negative relationships model including teacher-child conflict and peer rejection.

The Present Study

This study extends prior research by examining developmental links between positive and negative aspects of teacher-child and peer relationships and disobedience, in a clinical sample of 340 boys with psychiatric disorders in special education who were followed across one school year. Note that as relatively few girls with psychiatric disorders receive special education in Dutch segregated settings (Stoutjesdijk & Scholte, 2009), we only included boys in our study. Specifically, we aimed to study (1) the nature of the developmental links between boy's disobedience and their social classroom relationships, (2) whether developmental links between teacher-child and peer relationships indirectly impact boys' disobedience, (3) whether the developmental links between boy's disobedience and classroom relationships differ as a function of boys' age, and (4) whether negative aspects of social relationships with teachers and peers (i.e., teacher-child conflict and peer rejection) affect these boys' behavioral development more than positive aspects (i.e., teacher-child closeness and peer acceptance). Based on theoretical research and related empirical work in general education, we first expect to find the previously reported developmental links between disobedience and social classroom relationships to be also present in boys in special education. Second, we expect to find developmental links between social classroom relationships. Third, we expect to find the teacher-child relationship's impact on disobedience to be stronger for younger than for older boys and the impact of peer relationships on disobedience to be stronger for older than for younger boys. Fourth, we expect a stronger impact of negative than positive social relationships on disobedience.

Methods

Procedure and Participants

According to procedures approved by the Dutch Medical Ethics Committee for Mental Health Care (METiGG), written informed consent to participate in this study was obtained from school management (school participation), teachers (teacher participation), and parents (child participation). Children had been informed on the study's purpose and voluntary participation through leaflets. Eleven segregated

schools for special education, including 58 classes for children with psychiatric disorders, agreed to participate in the study. Within the first 6 weeks of the school year, the principals of three of the schools decided that a total of six classes were not able to participate in the study due to problems present in these classes such as teachers resigning or experiencing burnout problems. Over the school year, 70 teachers gave written informed consent to participate in the study and to complete questionnaires about their students. These teachers were considered the main teacher as they taught these boys most days of the week. These teachers' mean age was 38.1 years (range 19-62 years), 81.4% were female, 85.7% had a bachelor's degree, and their mean years of experience in special and general education was 13.1 (range 1-48 years). The mean number of children in each class was 9.8. All boys (87% of the children in these classes) in grades 1-6 who were in a participating class at the start of the study were eligible for inclusion (n = 424). For 85% of these boys (n = 362), parental informed consent was obtained. During the school year, 22 boys dropped out of the study because they were transferred to other schools, resulting in a final study sample of 340 boys.

The boys' mean age in the final sample was 10.1 years (range 5-13 years, SD = 1.58) and they had a mean IQ of 88.9 (range 56-143, SD = 15.38). We obtained information on psychiatric diagnoses from school medical files. The certified mental health professionals who had diagnosed the children at the time of placement in special education were not affiliated with our study. All boys had at least one psychiatric disorder and 48% of the boys had comorbid psychiatric disorders. Most common psychiatric disorders were ASD (46.2%), ADHD (39.4%), DBD (29.4%), anxiety disorder (5.3%) and mood disorder (3.8%). Most common comorbid disorders were ASD with ADHD and ADHD with DBD (both 13.8%). Parents' nationality at birth was used to asses boys' ethnicity (Dutch: 46.8%, ethnic minority: 14.1%, unknown: 39.1%). To provide an indication of boys' SES, their parents' occupational level was used (low: 27.4%, middle: 23.8%, high: 11.5%, unknown: 37.4%). Boys lost to follow-up did not differ from participating boys with regard to child characteristics (M_{age} = 9.7 years, SD = 1.93, p = .30; M_{IQ} = 90.2, SD = 11.31, p = .72) or on baseline assessments of disobedience (M = 0.22, SD = 0.21, p = .97), peer acceptance (M = 0.34, SD = 0.20, p = .50), and rejection (M = 0.27, SD = 0.24, p = .25). However, they had marginally significant lower scores on teacher-child closeness (M = 3.50, SD = 0.77, p = .08) and marginally significant higher scores on teacher-child conflict (M = 2.81, SD = 0.98, p = .07).

This study was executed as part of a randomized controlled trial. Half of the study sample received a preventive intervention program, the Good Behavior

Game, aimed at improving children's behavioral problems. Results showed that at the end the school year, the intervention had not affected the boys' teacher-child or peer relationships. The intervention had a small effect (Cohen's d = 0.14) on boys' behavioral problems: the disruptive behavior of boys in the intervention group remained relatively stable while the level of disruptive behavior in the control group increased somewhat over the school year (see chapter 6). Given the limited impact of the intervention, we included all boys in the current study. To correct for a possible effect of the intervention on the developmental links between disobedient behavior and social classroom relationships, we added study condition as a covariate in the analyses (control group = 0; intervention group = 1).

Measures

There were three assessment waves: at the beginning, halfway through, and at the end of the school year.

Disobedient behavior. Disobedient behavior was evaluated by means of peer nominations (Coie & Dodge, 1988) using the question *'which child disobeys the teacher?'* An unlimited number of children could be nominated. To account for variability in classroom size, scores were adjusted by dividing each individual child's total number of nominations by the number of participating children in the class minus one (self-nominations were not allowed). This meant that scores for disobedient behavior could range between 0 and +1. Over the three measurement waves, the mean number of children providing peer nomination data in relation to each classmate ranged between 9.0 to 9.6 (range SD: 2.4 - 2.5; median number of nominating classmates: 9). In addition, over the three measurement waves, between 85% and 94% of the children received nominations from 7 classmates or more. Although there is not much empirical research on the reliability of peer nominations, it has been found that a minimum participation rate of 40-85% is needed to yield reliable peer nominations scores, depending on class size and specific item, because there is more classroom agreement on children's behavior than on affective reactions such as peer relationships (Marks, Babcock, Cillessen, & Crick, 2013). As the mean participation rate of children providing peer nominations in our sample ranged between 85% and 92% across the three measurement waves, the participation rate was considered large enough to obtain reliable peer nominations data. In addition, peer nominations are considered a valid way of assessing children's classroom behavior (Diamantopoulou, Henricsson, & Rydell, 2005).

Teacher-child relationship. Teacher reports of the teacher-child relationship were collected using the Closeness (11 items, Cronbach's alpha .88-.90) and Conflict subscales (11 items, Cronbach's alpha .91-.93) of the Student Teacher Relationship Scale (STRS; Koomen, Verschueren, & Pianta, 2007; Pianta, 2001). Teachers rated items such as '*I share an affectionate, warm relationship with this child*', and *'This child and I always seem to be struggling with each other'* on a 5-point scale ranging from 1 (*definitely does not apply*) to 5 (*definitely applies*). Good convergent validity of the STRS has been established (Doumen et al., 2009).

Peer relationships. Peer nominations of 'liked most' and 'liked least' children in class were used to assess peer acceptance and rejection. Similar to disobedience, scores were corrected for variability in classroom size. Although it is possible that children with severe emotional and behavioral disorders react differently to peer acceptance and rejection (Little & Kobak, 2003), Zakriski and Prinstein (2001) found that peer nominations were meaningful and related to social adaptation and psychological and behavioral adjustment in a clinical inpatient setting of children with significant emotional and behavioral problems.

Data Analysis

Autoregressive cross-lagged models were fitted in Mplus 6.12 (Muthén & Muthén, 1998-2010). This software package allows for the use of full information maximum likelihood (FIML) estimation to account for missing data. This FIML approach uses all information available in the data to estimate the individual log likelihood functions. Yet, only a small amount of data were missing. With regard to the STRS as rated by teachers, missing data ranged from 1 to 5% in each of the three assessment waves. With regard to peer nominations, missing data ranged from 4 to 7%. We used maximum likelihood estimation with robust standard errors (MLR) as the estimator in our analyses because it is robust against non-normality. We adjusted the standard errors of the estimated coefficients at the classroom level using the cluster-sampling module in Mplus in order to account for the hierarchical structure of the data, i.e., the dependencies among the observations (children) within clusters (classrooms). Fit of the theoretical models to the data was tested using the Comparative Fit Index (CFI), the Root Mean Squared Error of Approximation (RMSEA), and the Standardized Root Mean square Residual (SRMR). The fit of the models was considered adequate for a CFI above .95, a RMSEA below .06, and an SRMR below .08 (Hu & Bentler, 1999).

Parameter estimates were controlled for study condition (intervention vs. control). For model parsimony, only the significant associations between study condition and the three outcome measures at each wave were retained in the model. Children's IQ was also considered for inclusion in the analyses, however, as there were no significant associations between children's IQ and the three outcomes measures, IQ was not included in our models.

To test our first hypothesis on the developmental links between disobedience and teacher-child and peer relationships, two separate models were fitted. The first model contained positive dimensions of teacher-child and peer relationships, the second contained the negative dimensions (see Figure 4.1). We started by fitting a baseline model (M1) which contained only autoregressive paths and cross-sectional correlations. The autoregressive part models the stability within each construct by regressing each variable on their immediate prior value. The cross-sectional part models the correlations between the three variables within one time point. Next, we tested the improvement of model fit over the baseline model when each of the six developmental links (model 2a: teacher to behavior; model 2b: behavior to teacher; model 2c: peers to behavior; model 2d: behavior to peers; model 2e: teacher to peers; model 2f: peers to teacher) was subsequently added using the Satorra-Bentler scaled chi-square difference test (TRd; Satorra & Bentler, 2001). We then estimated the final model (M3), which contained the links of the previous models (M2a-f) that showed superior model fit over M1. To test our second hypothesis regarding the impact of age, the total sample was split into a group of middle childhood boys (5-9 years old: $n = 44\%$) and a group of late childhood boys (10-13 years old: $n = 56\%$). We conducted multiple group modeling (younger vs. older boys) to test whether the strength of the developmental links were equal between age groups using Wald chi-square tests. To test our third hypothesis that developmental links are stronger between negative than positive social relationships and disobedience, we fitted two different models. Compared to Figure 4.1, we now fitted one model containing the positive and negative dimensions of the teacher-child relationship (closeness vs. conflict) and disobedience and a second model containing the positive and negative dimensions of peer relationships (acceptance vs. rejection) and disobedience. The positive social relationships were reverse coded to test whether the strength of the developmental links between social relationships and disobedience were equal for positive and negative aspects of relationships.

Table 4.1

Means, Standard Deviations, and Correlations of Social Relationships and Disobedient Behavior

	M	*SD*	$1T_2$	$1T_3$	$2T_1$	$2T_2$	$2T_3$	$3T_1$	$3T_2$
$1T_1$	3.76	0.66	+.63*	+.58*	-.37*	-.26*	-.17*	-.26*	-.22*
$1T_2$	3.72	0.68		+.68*	-.26*	-.41*	-.30*	-.18*	-.23*
$1T_3$	3.72	0.68			-.17*	-.26*	-.36*	-.10	-.19*
$2T_1$	2.43	0.93				+.65*	+.57*	+.47*	+.48*
$2T_2$	2.57	0.93					+.73*	+.34*	+.51*
$2T_3$	2.51	0.94						+.30*	+.40*
$3T_1$	0.22	0.21							+.52*
$3T_2$	0.24	0.20							
$3T_3$	0.29	0.24							
$4T_1$	0.37	0.20							
$4T_2$	0.40	0.21							
$4T_3$	0.44	0.22							
$5T_1$	0.22	0.18							
$5T_2$	0.24	0.19							
$5T_3$	0.28	0.22							

Results

Disobedience and Positive and Negative Aspects of Teacher-Child and Peer Relationships

Means, standard deviations and correlations of disobedience and teacher-child and peer relationships are in Table 4.1. Table 4.2 reports on the fit statistics of the model fitting strategy. In the positive relationships model, model fit significantly improved only when developmental links were included from peer acceptance to disobedience (M2c) and from disobedience to peer acceptance (M2d). Therefore, our final model (M3) consisted only of these four developmental links. All estimates are presented in Table 4.3. Lower levels of peer acceptance predicted increases in

$3T_3$	$4T_1$	$4T_2$	$4T_3$	$5T_1$	$5T_2$	$5T_3$
-.08	+.01	+.07	+.08	-.13*	-.12*	-.16*
-.18*	+.11	+.14*	+.08	-.22*	-.21*	-.25*
-.13*	+.04	+.08	+.06	-.10	-.16*	-.22*
+.36*	-.03	-.12*	-.11	+.24*	+.24*	+.21*
+.39*	-.05	-.15*	-.10	+.17*	+.23*	+.26*
+.42*	-.09	-.17*	-.11	+.23*	+.24*	+.25*
+.43*	-.12*	-.21*	-.17*	+.40*	+.36*	+.27*
+.49*	-.16*	-.36*	-.23*	+.33*	+.45*	+.37*
	-.16*	-.23*	-.22*	+.29*	+.33*	+.41*
		+.48*	+.44*	-.53*	-.35*	-.34*
			+.55*	-.31*	-.65*	-.49*
				-.30*	-.44*	-.68*
					+.52*	+.42*
						+.56*

Note. 1 = teacher-child closeness, 2 = teacher-child conflict,
3 = disobedient behavior, 4 = peer acceptance, 5 = peer rejection; * = $p \leq .05$.

disobedience through the first half of the school year. In addition, higher levels of disobedience predicted decreases in boys' peer acceptance through the first half of the school year. As these results were not replicated in the second half of the school year, we tested whether links in the first and second half of the school year significantly differed. Results showed that model fit was not significantly reduced when the developmental links from T_1 to T_2 were constrained to be equal to the links from T_2 to T_3 (peers to behavior: TRd(1) = 0.019, p = .89; behavior to peers:

Table 4.2

Fit Statistics and Model Comparison of the Positive and Negative Relationships Models

Model		Absolute fit		
		χ^2	*df*	scf
Positive relationships model[a]	M1: baseline model	70.670	29	1.379
	M2a: teacher to behavior	65.761	27	1.403
	M2b: behavior to teacher	71.042	27	1.355
	M2c: peers to behavior	64.886	27	1.407
	M2d: behavior to peers	62.319	27	1.396
	M2e: teacher to peers	68.821	27	1.404
	M2f: peers to teacher	66.753	27	1.405
	M3: final model	56.894	25	1.427
Negative relationships model[b]	M1: baseline model	98.032	28	1.317
	M2a: teacher to behavior	65.512	26	1.344
	M2b: behavior to teacher	96.769	26	1.306
	M2c: peers to behavior	82.062	26	1.325
	M2d: behavior to peers	78.053	26	1.345
	M2e: teacher to peers	91.892	26	1.344
	M2f: peers to teacher	94.319	26	1.340
	M3: final model	33.550	20	1.392

Absolute fit				Relative fit		
CFI	RMSEA	SRMR	Comparison	TRd	Δ*df*	*p*-value
.93	.07	.07				
.94	.07	.06	Model 1 - 2a	4.921	2	.09
.93	.07	.07	Model 1 - 2b	0.700	2	.70
.94	.06	.06	Model 1 - 2c	6.153	2	.05
.94	.06	.06	Model 1 - 2d	9.097	2	.01
.93	.07	.07	Model 1 - 2e	0.796	2	.67
.93	.07	.07	Model 1 - 2f	3.566	2	.17
.95	.06	.05	Model 1 - 3	15.075	4	<.01
.91	.09	.11				
.95	.07	.09	Model 1 - 2a	42.505	2	<.01
.91	.09	.11	Model 1 - 2b	1.868	2	.39
.93	.08	.10	Model 1 - 2c	16.798	2	<.01
.94	.08	.09	Model 1 - 2d	25.317	2	<.01
.92	.09	.10	Model 1 - 2e	5.803	2	.05
.92	.09	.11	Model 1 - 2f	2.673	2	.26
.98	.05	.04	Model 1 - 3	72.958	8	<.01

Note. scf = scaling correction factor; *TRd* = Sattora-Bentler scaled chi-square difference; *Δdf* = difference in models' *df*; [a] = the positive relationships model includes the significant pathway from study condition to peer acceptance at T_1; *b* = the negative relationships model includes the significant pathways from study condition to peer rejection at T_1 and T_2.

Table 4.3

Standardized and Unstandardized Estimates of the Final Models

	Positive relationships model			Negative relationships model		
Parameter	*b*	*SE*	*B*	*b*	*SE*	*B*
Autoregressive correlations						
T_1 teacher to T_2 teacher	0.63*	0.06	0.62	0.66*	0.05	0.66
T_2 teacher to T_3 teacher	0.69*	0.06	0.68	0.74*	0.04	0.73
T_1 behavior to T_2 behavior	0.50*	0.07	0.51	0.32*	0.06	0.32
T_2 behavior to T_3 behavior	0.57*	0.08	0.48	0.42*	0.09	0.36
T_1 peers to T_2 peers	0.49*	0.06	0.47	0.50*	0.06	0.48
T_2 peers to T_3 peers	0.59*	0.05	0.55	0.57*	0.06	0.50
Cross-sectional correlations						
T_1 teacher with T_1 behavior	-0.04*	0.01	-0.25	0.09*	0.02	0.47
T_1 peers with T_1 behavior	-0.01*	0.00	-0.13	0.02*	0.00	0.42
T_1 teacher with T_1 peers	0.00	0.01	0.01	0.05*	0.01	0.27
T_2 teacher with T_2 behavior	-0.01*	0.01	-0.13	0.04*	0.01	0.33
T_2 peers with T_2 behavior	-0.01*	0.00	-0.29	0.01*	0.00	0.30
T_2 teacher with T_2 peers	0.01	0.01	0.12	0.02*	0.01	0.13
T_3 teacher with T_3 behavior	0.00	0.01	0.02	0.03*	0.01	0.22
T_3 peers with T_3 behavior	-0.00	0.00	-0.09	0.01*	0.00	0.23
T_3 teacher with T_3 peers	0.00	0.01	0.02	0.01	0.01	0.05

Developmental links[a]						
T_1 teacher to T_2 behavior	.	.	.	0.06*	0.02	0.29
T_2 teacher to T_3 behavior	.	.	.	0.05*	0.02	0.18
T_1 behavior to T_2 teacher	.	.	.	.	.	.
T_2 behavior to T_3 teacher	.	.	.	.	.	.
T_1 peers to T_2 behavior	-0.10*	0.06	-0.10	0.16*	0.06	0.14
T_2 peers to T_3 behavior	-0.08	0.05	-0.07	0.15*	0.07	0.12
T_1 behavior to T_2 peers	-0.15*	0.06	-0.15	0.15*	0.06	0.16
T_2 behavior to T_3 peers	-0.04	0.06	-0.04	0.12*	0.07	0.11
T_1 teacher to T_2 peers	.	.	.	0.01	0.01	0.03
T_2 teacher to T_3 peers	.	.	.	0.02	0.01	0.09
T_1 peers to T_2 teacher	.	.	.	.	.	.
T_2 peers to T_3 teacher	.	.	.	.	.	.

Note. [a] = one-tailed test; empty cells are links not in the final model; * = $p \leq .05$).

TRd(1) = 1.829, p = .18). With these time constraints, developmental links were significant between all waves. The upper part of Figure 4.1 reports on the results of the positive relationships model with both these time constraints.

In the negative relationships model, model fit significantly improved compared to our baseline model when developmental links were included from teacher-child conflict to disobedience (M2a), from peer rejection to disobedience (M2c), from disobedience to peer rejection (M2d), and from teacher-child conflict to peer rejection (M2e; see Table 4.2). In Table 4.3 it can be seen that higher levels of teacher-child conflict predicted increases in disobedience but not vice versa. In addition, higher levels of peer rejection predicted increases in disobedience throughout the school year and higher levels of disobedience predicted increases in peer rejection throughout the school year. Although adding developmental links between teacher-child conflict and peer rejection improved model fit compared to our baseline model, these links were no longer significant above and beyond the six other developmental links in our final model. The results of our final model (M3) are depicted in Figure 4.1 (lower part).

The Impact of Age

Next, we examined whether the developmental links from teacher-child and peer relationships to disobedience differed for younger versus older boys. Wald test results showed that with regard to the model containing positive classroom relationships, only the link from disobedience in the beginning of the school year to peer acceptance halfway through the school year was stronger for older than for younger children (younger children: B = -0.01; older children: B = -0.26; $\chi^2(1)$= 5.34, p = .02). In the model containing negative classroom relationships, no age differences were found between older and younger children.

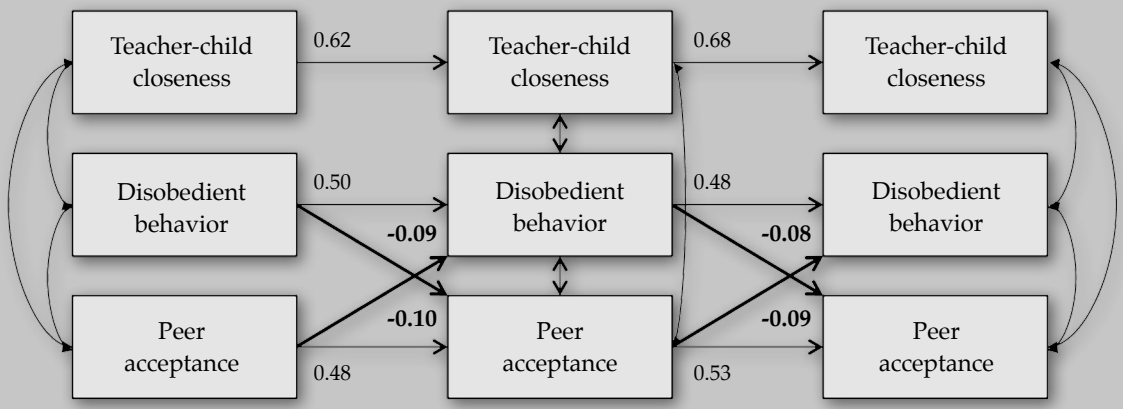
Negative Versus Positive Social Relationships

We examined the magnitude of the impact of positive versus negative social relationships on disobedience. To this end, two new models were fitted, one model for teacher-child closeness and conflict with disobedience and a second model for peer rejection and acceptance with disobedience. Results showed stronger links for conflict than closeness to disobedience during the first half of the school year (T_1conflict-T_2behavior: B = 0.29, T_1closeness-T_2behavior: B = 0.01, $\chi^2(1)$ = 5.43, p = .02), but no significant difference between the impact of conflict and closeness was found during the second half of the school year (T_2conflict-T_3behavior: B = 0.17, T_2closeness-T_3behavior: B = 0.02, $\chi^2(1)$ = 1.47, p = .23). Developmental links from disobedience to teacher-child conflict compared to closeness did not differ significantly in the first (T_1behavior-T_2conflict: B = 0.05, T_1behavior-T_2closeness: B = 0.01, $\chi^2(1)$ = 0.50, p = .48) and second half (T_2behavior-T_3conflict: B = 0.03, T_2behavior-T_3closeness: B = 0.08, $\chi^2(1)$ = 0.18, p = .68) of the school year. Results with regard to peer acceptance vs. rejection showed no stronger links of peer rejection than of acceptance to disobedience across the first (T_1rejection-T_2behavior: B = 0.14, T_1acceptance-T_2behavior: B = 0.04, $\chi^2(1)$ = 1.44, p = .23) and second half (T_2rejection-T_3behavior: B = 0.15, T_2acceptance-T_3behavior: B = -0.01, $\chi^2(1)$ = 1.76, p = .19) of the school year. However, disobedience had a stronger link to rejection than to acceptance during the second half of the school year (T_2behavior-T_3rejection: B = 0.14, T_2behavior-T_3acceptance: B = 0.00, $\chi^2(1)$ = 7.64, p < .01), but not during the first half of the school year (T_1behavior-T_2rejection: B = 0.19, T_1behavior-T_2acceptance: B = 0.15, $\chi^2(1)$ = 0.33, p = .57).

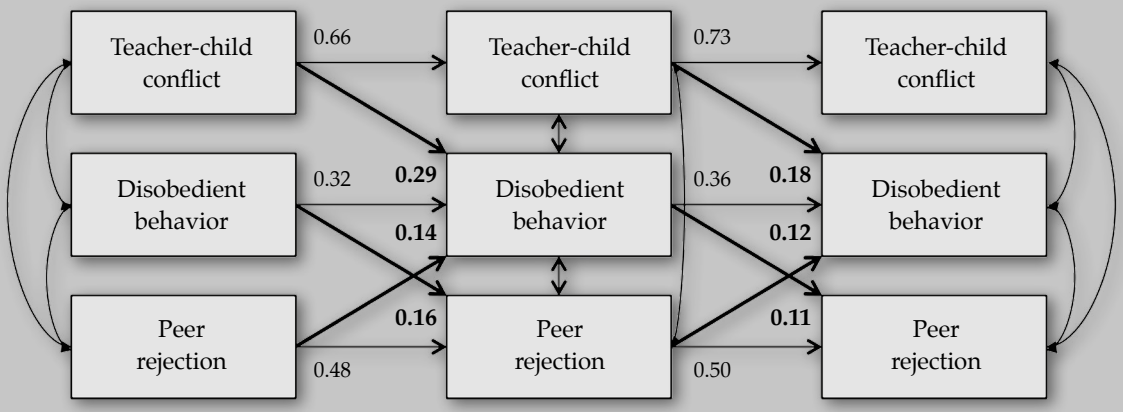
Figure 4.1

Final Autoregressive Cross-Lagged Model of Positive (Upper Part) and Negative (Lower Part) Social Classroom Relationships.

Positive Social Classroom Relationships Model



Negative Social Classroom Relationships Model



Note. Depicted values reflect standardized regression coefficients (β). Only the significant developmental links are depicted. Cross-sectional correlations between the three constructs were also estimated but values are not depicted for readability.

Discussion

In this study, we set out to examine the developmental links between disobedience and teacher-child and peer relationships in a sample of boys with psychiatric disorders placed in segregated settings for special education followed across one school year. Our results confirm previous evidence supporting the importance of teacher-child conflict, but not closeness, and positive and negative peer relationships for the behavioral development of children and extend these results to boys with psychiatric disorders in special education. However, contrary to our expectations, teacher-child and peer relationships were not longitudinally related and the impact of boys' age on the developmental links was minimal. We did find support for a stronger effect of negative than positive relationships on disobedience.

Developmental Links between Disobedience and Social Relationships

Our study does not show a consistent impact of the teacher-child relationship on boys' behavioral development, as an additive impact of conflict, not closeness, on later disobedience was found. This suggests that in special education, conflicts with teachers have a stronger longitudinal impact on classroom behavior than a close relationship with teachers. In line with studies in general education (De Laet et al., 2014; Zhang & Sun, 2011) we found that teacher-child conflict increased children's disobedience throughout the school year. On the other hand, our finding that a more positive teacher-child relationship didn't reduce boys' disobedience was not in line with some previous studies in general education (Baker, 2006; Hughes et al., 1999). However, the studies by Baker and Hughes et al. did not control for cross-sectional associations between teacher-child closeness and behavioral problems and thereby possibly overestimated developmental effects. Studies in general education that did conduct parallel assessments over time, and thereby controlled their outcomes for cross-sectional associations, actually showed mixed results. One study found higher teacher-child preference to decrease behavioral problems (Mercer & DeRosier, 2008) but others studies did not (Leflot et al., 2011; Zhang & Sun, 2011). The difference between our and Mercer and DeRosier's findings might be explained by the younger age of their children making them more susceptible to teacher expectancies than the boys in our study (Kuklinski & Weinstein, 2001). Another explanation for the lack of an additive impact of teacher-child closeness on boys' behavioral development in our sample relates to the relatively high levels of social and behavioral problems of boys with psychiatric disorders in special

education (Stoutjesdijk & Scholte, 2009). These boys may have more difficulty in bonding with authority figures such as teachers - and may therefore be less susceptible to positive influences from teachers - a possibility which requires further research.

The teacher-child relationship does not seem affected by boys' disobedience as a reverse effect was not supported. This finding indicates that the teacher-child relationship - especially the negative component - is important for boys' future behavior, but that teachers' interactions with boys are not affected by their students' behavioral problems in special education. This in line with some studies in general education (Leflot et al., 2011; Zhang & Sun, 2011), indicating that prior teacher-child closeness and concurrent behavioral problems are stronger predictors of concurrent teacher-child closeness than prior behavioral problems. However, opposite to our findings, some studies did find behavioral problems to affect teacher-child conflict (De Laet et al., 2014; Doumen et al., 2008; Zhang & Sun, 2011). As both the studies by Doumen et al. and Zhang and Sun also examined these developmental links within one school year, this suggests that in general education, the teacher-child relationship seems affected by children's behavioral problems whereas in special education for children who all show some degree of behavioral problems, the teacher-child relationship seems less affected by such behavior. Thus, in general education, behavioral problems do present teachers with challenges that lead to conflict, but these challenges generally do not affect the teacher-perceived closeness of the teacher-child relationship. An explanation as for why special education teachers appear not to be affected by boys' prior levels of behavioral problems may be that special education teachers have specifically chosen, and undergone additional training, to work with children with severe levels of behavioral problems. In addition, this finding suggests that special education teachers accept and treat their students irrespective of their behavioral problems, which may be an important positive characteristic of special education as it contributes to creating a safe environment for vulnerable children.

With regard to peer relationships, we found support for developmental links between both positive and negative aspects of peer relationships and boys' behavioral development. Our findings show that peer acceptance reduces later disobedience, which in turn increases later peer acceptance. In addition, we found full transactional links between peer rejection and disobedience indicating that prior disobedience evoked later rejection by peers, but once established, peer rejection had an additive effect on boys' development of disobedience independent of prior disobedience. These results are consistent with results from studies in

general education (Leflot et al., 2011; Mercer & DeRosier, 2008; Sturaro et al., 2011). The current study thereby extends prior research by signifying the importance of peer relationships for boys' behavioral development, for better and for worse, irrespective of boys' level of problematic behavior and educational setting.

Developmental Links between Teacher-Child and Peer Relationships

In line with the study by Leflot et al. (2011), but in contrast to expectations based on social referencing theory (Hughes et al., 2001) and a number of other empirical studies conducted in general education (Chang et al., 2007; Hughes & Chen, 2011; De Laet et al., 2014; Mercer & DeRosier, 2008), we found that teacher-child conflict and closeness did not predict later increases in peer acceptance or rejection. However, in these previous studies, only concurrent teacher-child and peer relationships were assed (Hughes et al., 2001), estimates were not corrected for prior and concurrent teacher-child interactions (Chang et al., 2007), or not controlled for the impact of children's behavior (Hughes et al., 2001), which may all lead to overestimating developmental effects. Indeed, comparable to the results of Hughes and Chen, links between teacher-child conflict and peer rejection were significant when other developmental links were not included in our model. Our findings thus suggest that teachers are indeed the classroom authority who help shape norms and expectations with regard to peer interactional processes (Farmer, McAuliffe Lines, & Hamm, 2011), but that teachers' impact on peer relationships is less influential than the impact of children's disobedience. Please note however that although the links between teacher-child conflict and peer rejection were not significant in our final model, the range of the standardized estimates of these links were in line with the significant estimates presented in the studies of Mercer and DeRosier and De Laet et al. In addition, in line with the findings of De Laet et al. but in contrast to other findings (Hughes & Chen, 2011; Leflot et al., 2011; Mercer & DeRosier, 2008), our study showed no support for the notion that peer relationships influence the teacher-child relationship over time. The difference between these and our findings may be explained by previously mentioned methodological issues. Also, in general education, a decreased teacher preference for a child is explained by the lack of classroom participation as a result of peer rejection (Leflot et al., 2011). However, this may not apply to boys with special educational needs in self-contained classrooms who show limited classroom participation from time to time, irrespective of the positivity or negativity of their peer relationships.

The Impact of Age

In contrast to our expectations based on the findings by Kuklinski and Weinstein (2001) and Gifford-Smith and Brownell (2003), developmental links between disobedience and social relationships were largely similar for younger and older boys. Before the start of the study, we expected the teacher-child relationship to be more important for younger than older boys and peer relationships to be more important for older than younger boys, however we only found one developmental link supporting this hypothesis. It thus appears that age is not that important for the developmental links among classroom processes in special education. This may be explained by the fact that for children with various psychiatric disorders in special education, their developmental level has a greater impact on their social and behavioral functioning than age. Because boys with psychiatric disorders who are similar in age may differ widely in their social and emotional development, their developmental level may thus overshadow true age effects. Therefore, in future studies in special education, it may be useful to assess both developmental level and age to test their impact on the links between behavioral problems and social classroom relationships.

Positive Versus Negative Social Experiences and Boys' Behavioral Development

In line with our expectations, our study shows that teacher-child conflict has a greater impact on boys' disobedience than teacher-child closeness, confirming the theory of Baumeister et al. (2001) that individuals react more strongly to relational stressors than positive relational aspects. These relational stressors may produce strong negative emotions that may interfere with classroom participation and thus a child's sense of belonging (Ladd et al., 1999). With regard to peer relationships, our finding that disobedience has more impact on peer rejection than acceptance, whereas peer rejection and acceptance were equally important for boys' development of disobedience, indicates that both positive and negative peer relationships are important for boys' disobedience development, but that when boys show undesirable behavior, they may easily acquire a 'bad' reputation which is difficult to lose (Baumeister et al., 2001). The finding that negative social relationships more strongly impacted boys' classroom behavior than positive social relationships is especially important for boys in special education as these children not only already encounter more negative social interactions (Humprey & Symes, 2010; Little & Kobak, 2003; Murray & Greenberg, 2001), but also receive three times more punishment than children without social-emotional and behavioral disorders

(Scott, Alter, & Hirn, 2011). It is thus vital to prevent the development of negative interactional patterns in special education settings.

Limitations

This study has four main limitations that should be considered. The first limitation regards the generalizability of our findings. Because special education policies for children with psychiatric disorders and additional educational needs vary around the world, it is unclear to what extent our results can be generalized to children with psychological disabilities in special education in countries other than the Netherlands. Also, although drop-out was low (6%) and our study had a high parental consent rate (85%), the study's generalizability may be limited by selective non-participation. In addition, as data on ethnicity and SES were obtained with parent reports which had a relatively low response rate (61%), the percentage of ethnic minority boys and boys with low SES may have been underestimated. Next, we focused only on boys in our study as few girls are placed in segregated settings for special education in the Netherlands. Whether our results also apply to girls in special education remains to be studied. Second, as many boys in our sample were diagnosed with ASD and therefore likely experience social difficulties because of their problems in perceiving and understanding social behavior (Bellini et al., 2007), and because self-perceptions of social status may impact the developmental links between social relationships and behavior (Mayeux & Cillessen, 2008), it is possible that the strength of these links differ for children with various diagnoses in special education settings. This study thus serves as a first important step in identifying the developmental links between behavioral problems and social interactions in the classroom in children with complex social-emotional and behavioral difficulties in special education. The strength of the links between classroom relationships and behavior in children with specific psychiatric disorders remains to be studied in future research. Third, similar to the study by Zhang and Sun (2011), our results are limited to links during one school year. Developmental links within a school year may be stronger than links across two to three school years (e.g., Hughes & Chen, 2011; De Laet et al., 2014; Leflot et al., 2011; Mercer & DeRosier, 2008) as social relationships within a school year may remain more stable. To be able to better compare special to general education, future research may want to examine links among classroom relationships and children's behavior across years in special education settings. Fourth, as both peer relationships and behavioral problems were measured using peer nominations, the stronger developmental links between these constructs than between the teacher-child relationship and behavioral

problems may be partly attributed to same-source bias. However, the fact that many classmates independently rated each child makes the peer nominations procedure less sensitive for same-source bias than single-rater procedures. In addition, we used multiple informants in this study who rated similar constructs in many general education studies (i.e., peer-rated peer relationships, teacher-rated teacher-child relationship, and peer-rated behavioral problems; Hughes & Chen, 2011; Leflot et al., 2011; Mercer & DeRosier, 2008). Future research may want to examine these constructs using different informants or direct observations as this may yield a more complete understanding of classroom processes in special education.

Conclusion and Practical Implications

In summary, we found that despite differences in the severity of behavioral problems between boys in general and special education, the developmental links between disobedience and social relationships are quite similar across these two contexts: both teacher-child and peer relationships play an important role in the development of classroom behavior. With regard to peer relationships, it appears that boys with high levels of behavioral problems elicit problematic relationships with peers which exacerbates their already present problems. Being less preferred by classmates may thus be a stepping stone to a cascade of negative effects, thereby amplifying the risk faced by these already vulnerable children. Overall, our findings suggest that reducing negative interactional patterns may be more important than developing more positive interactional patterns in helping to prevent the development of problematic classroom behavior. As teacher-child conflict increased boys' disobedience, this basically implies that teachers should try to not fall into the trap of developing negative interactional patterns. Considering that most of these boys cope with social problems, it is important that special education teachers work on improving boys' social competence. In addition, in line with the findings of Gifford-Smith and Brownell (2003), teachers may also work on positively re-evaluating negative peer behavior in such a way that these boys experience their classmates as being helpful instead of hostile, to enhance boys' social and behavioral development and thereby making a difference for these vulnerable children.

Chapter 5

Differences between Boys with Severe Emotional and Behavioral Problems and Boys with Autism in Developmental Links between Disobedience and Teacher-Child Closeness

This chapter is based on:
Breeman, L.D., Van Lier, P.A.C., Wubbels, T., Verhulst, F.C., Van der Ende, J., Maras, A., Hopman, J.A.B., & Tick, N.T. *Differences between boys with severe emotional and behavioral problems and boys with autism in developmental links between disobedience and teacher-child closeness.* Manuscript submitted for publication.

Chapter 6

Effects of the Good Behavior Game on the Social, Emotional, and Behavioral Problems of Children with Psychiatric Disorders in Special Education

This chapter is based on:
Breeman, L.D., Van Lier, P.A.C., Wubbels, T., Verhulst, F.C., Van der Ende, J., Maras, A., Struiksma, A.J.C., Hopman, J.A.B., & Tick, N.T. (2015). Effects of the Good Behavior Game on the behavioral, emotional and social problems of children with psychiatric disorders in special education settings. Provisionally accepted for publication in the *Journal of Positive Behavior Interventions*.

Chapter 7

General Discussion

The aim of this thesis was to investigate the social classroom dynamics that shape the behavioral adjustment of children with psychiatric disorders in special education. Studies in general education have consistently shown that both teacher-child relationships and peer relationships are important for the behavioral development of children. We examined the importance of these classroom relationships for children with severe emotional and behavioral disorders (EBD) in special education settings who are at risk for experiencing poor psychosocial, emotional, and behavioral adjustment after leaving school (Heijmens Visser, Van der Ende, Koot, & Verhulst, 2003; Wielemaker, 2009). As the second aim of this thesis was to explore avenues for improving special education, we examined whether a classroom-based behavioral management program conducted by teachers, the Good Behavior Game (GBG), had beneficial effects on children's emotional and behavioral adjustment, social classroom relationships, and teachers' sense of competence and wellbeing, using a cluster randomized controlled design.

In this chapter, I will discuss our most important findings regarding the central topics of this thesis. First, I will discuss the characteristics of our sample of special education children and teachers. To answer the first research question, I will subsequently discuss the importance of positive social classroom relationships, give a general conclusion concerning the studies that were conducted, and discuss educational implications regarding possibilities to create positive social classroom relationships in special education. To answer the second research question, I will focus on the effectiveness of the GBG on improving social classroom relationships and children's classroom adjustment, the dosage and fidelity of the intervention implementation, and give a general conclusion and recommendations for GBG implementation in schools for special education. I will end this chapter with a section on the strengths and limitations of the studies conducted within this thesis and guidelines for future research.

Characteristics of Children with Psychiatric Disorders in Settings for Dutch Special Education

We first explored to what degree children with psychiatric disorders placed in segregated settings for special education in the Netherlands - and their teachers - differed from children and teachers in general education on the measures used in this study using normative scores from previous studies. Previous research already showed that these children, compared to children with psychiatric problems who attend general education, generally have a lower IQ and are more often diagnosed with multiple psychiatric diagnoses, indicating more severe emotional and behavioral problems (Inspectie van het onderwijs, 2010; Stoutjesdijk & Scholte, 2009). As could be expected, children in special education settings have substantially higher levels of emotional and behavioral problems than children in general education. With regard to their social relationships, children in special education also appear to encounter more problems. Specifically, teachers in special education felt less close towards their students than teachers in general education. With regard to their peer relationships, the children in special education, both boys and girls, experienced more peer victimization in the classroom than children in general education. Importantly, peer relationships may be especially troublesome for girls in special education, as they were less liked by their peers than girls in general education, in contrast to boys in special education who were generally well liked by peers. It needs to be said that this gender difference may be explained by the fact that boys are largely overrepresented in special education classrooms whereas friendships at this age are more often with same gender peers (Östberg, 2003). This finding implies that it may be especially important to closely watch the development of girls in special education settings.

The Importance of Positive Classroom Relationships

The first part of this thesis concerns the first central research question: 'Do social classroom relationships affect the behavioral adjustment of children with psychiatric disorders in special education?'

The Importance of Positive Peer Relationships in Special Education

Across the two chapters that focused on the impact of peer relationships on children's classroom adjustment (i.e., chapters 3-4), we consistently found evidence on the importance of peer relationships. Using our baseline data, we examined cross-sectional associations between peer relationships and children's behavioral adjustment. Although this approach limited the possibility of drawing causal inferences, it enabled us to examine the associations between social relationships and children's adjustment on both the individual and classroom levels. We found that individual peer relationships are related to children's individual behavior, which indicates that children who show more behavioral problems also experience their classroom peer environment as more hostile. Classroom peer interactions, as rated by the whole class, are associated with classroom levels of children's social adjustment.

In addition to these cross-sectional analyses, we studied the developmental impact of peer relationships on children's behavior to examine to what extent these two constructs impacted each other longitudinally. These analyses supported the importance of positive peer relationships for the behavioral development of boys in special education, above and beyond cross-sectional associations. Peer acceptance and peer rejection were found equally important for boys' development of disobedience. Peer acceptance reduces later disobedience, which in turn increases later peer acceptance. Consistent with results from studies conducted in general education (Leflot, Van Lier, Verschueren, Onghena, & Colpin, 2011; Mercer & DeRosier, 2008; Sturaro, Van Lier, Cuijpers, & Koot, 2011), boys with high levels of behavioral problems elicit more peer rejection, which exacerbates their already present behavioral problems.

These results thus extend prior research by signifying the importance of the quality of peer relationships for boys' behavioral development in special education, for better and for worse, irrespective of boys' level of problematic behavior and educational setting. Being more preferred by classmates may lead to a positive cycle of behavioral improvement and stronger friendships, whereas being less preferred by classmates may be a stepping stone to a cascade of negative effects, thereby amplifying the risk faced by these already vulnerable children.

The Importance of Positive Teacher-Child Relationships in Special Education

Across three chapters (i.e., chapters 3-5), the links between teacher-child relationships and children's behavioral problems were explored. An important finding in our baseline data was that differences between classes in aggregated levels of teacher-child closeness were not associated with classroom-level differences in children's adjustment. Thus, teachers' general friendliness or general positive attitude towards the students in class was not associated with children's classroom adjustment in special education. In contrast, congruent with results from general education (Buyse, Verschueren, Verachtert, & Van Damme, 2009; Mercer & DeRosier, 2008; Spilt, Koomen, & Thijs, 2011), individual children who formed more positive relationships with their teachers did show better emotional and behavioral classroom adjustment. This suggests that the individual relationship that a teacher has with a student may be more important for a child's functioning than teachers' general sense of closeness towards the children in the class. This finding implicates that when aiming to improve the teacher-child relationship in special education it may be most important to focus on improving dyadic teacher-child relationships, especially between teachers and children who show high levels of adjustment problems.

In addition to cross-sectional associations, we also examined the developmental impact of the teacher-child relationship on children's behavior and to what extent these two constructs were longitudinally related. First of all, both teacher-child closeness and teacher-child conflict did not seem developmentally affected by boys' disobedience, indicating that special education teachers perceive their relationships with students regardless of their students' level of behavioral problems. This can be considered an interesting finding because the teacher-child relationship seems developmentally affected by children's behavioral problems in general education (De Laet et al., 2014; Doumen, Verschueren, Buyse, Germeijs, & Luyckx, 2008; Zhang & Sun, 2011), where children generally cope with fewer behavioral problems. Perhaps this difference can be explained by the fact that special education teachers have specifically chosen to work with children with severe levels of behavioral problems and have undergone additional training to be able to do this. This may help these teachers to accept and treat their students irrespective of their level of behavioral problems, which can be regarded an important positive characteristic of special education settings. The fact that high levels of behavioral problems do not affect the teachers' long term view on their relationship with individual students may help teachers creating a safe environment for vulnerable children.

When we examined the reverse impact of the influence of teacher-child relationships on the development of disobedience, we also found some interesting results. Specifically, in line with studies conducted in general education (De Laet et al., 2014; Zhang & Sun, 2011), we showed that the amount of conflict in the teacher-child relationships impacted boys' adjustment over time, as it increased boys' disobedience throughout the school year. However, to our surprise, the level of emotional closeness between boys in special education and their teacher did not seem to impact their adjustment longitudinally. Thus, a teacher-child relationship characterized by conflict impacts disobedience more than teacher-child closeness, confirming the theory that individuals react more strongly to relational stressors than to positive relational aspects (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). Such relational stressors may produce strong negative emotions that may interfere with classroom participation and thus a child's sense of belonging (Ladd, Birch, & Buhs, 1999) and their classroom adjustment.

The lack of an additive impact of teacher-child closeness on boys' behavioral development in our sample may be related to the diversity of children placed in special education and thus the variety in children's psychiatric problems. For example, depending on the specific nature of their psychiatric disorders, some children may have more difficulty in bonding with authority figures, such as teachers, and may therefore be less susceptible to positive influences from teachers. Specifically, it seemed likely that the impact of teacher-child closeness on disobedience would differ between boys with solely severe emotional and behavioral problems (EBD) and boys who also received a diagnosis in the autistic spectrum (ASD), as the latter disorder is characterized by impairments in social communication. Indeed, when we compared boys with an ASD diagnosis to the other boys in special education who were mainly coping with EBD, we found some interesting differences between these two groups. Specifically, boys with EBD who experience lower levels of closeness between themselves and the teacher show increasing levels of disobedience over time. In turn, increased levels of disobedience in these children developmentally affected the relationship as experienced by the teacher, suggesting a vicious cycle of behavioral and relational difficulties among these boys. This suggests that the persistent behavioral problems of boys with EBD may indeed, as Sutherland, Lewis-Palmer, Stichter, and Morgan (2008) suggest, overwhelm a teacher's attempts to provide the necessary care and education and therefore induce a less positive teacher attitude towards these students.

In contrast, for boys diagnosed with ASD, the relationship with their teacher did not affect their disobedience over time and higher levels of disobedience in these boys were found to even positively affect their relationship with the teacher. Although this may seem contra-intuitive at first, these findings may be explained by the fact that disobedience of boys with ASD may be interpreted differently from disobedience of boys with EBD by teachers as the disobedient behaviors of boys with ASD can be an expression of non-verbal communication that something is amiss with the child's needs (Carr & Durand, 1985). Because teachers in special education are usually trained to deal with children with ASD, it is possible that these children's disobedience is regarded by their teacher as a stress reaction of the child because of their teacher behavior (Heflin & Alberto, 2001; Valenti, Cerbo, Masedu, De Caris, & Sorge, 2010). This may evoke feelings of protection within the teacher and by helping and investing in the child also increase their perception of closeness of the teacher-child relationship.

Conclusions and Educational Implications: How to Create Positive Social Classroom Relationships in Special Education?

Given teachers' responsibility for children's classroom adjustment, they are not only important targets for interventions but also for implementing classroom interventions (Han & Weiss, 2005). Practically, the results of our study suggest different avenues to improve social classroom dynamics for prevention and intervention purposes. First of all, teachers can invest in improving peer relationships in the classroom. Our results indicate that children who show more behavioral problems also experience their classroom peer environment as more hostile. Teachers may thus play a role in helping children in special education by working on positively re-evaluating negative peer behavior in such a way that these boys experience their classmates as being helpful instead of hostile, to enhance boys' social and behavioral development (Gifford-Smith & Brownell, 2003). In addition, the fact that classroom peer interactions were associated with classroom levels of children's social adjustment may implicate that in addition to help improve students' perceptions of peer behavior, classroom-interventions aimed at improving children's social adjustment or social skills may benefit from a focus on the social dynamics between children in a classroom. For example, by helping to reduce negative experiences in the classroom and to create a classroom context in which children feel safe and comfortable.

Secondly, the teacher can focus on improving his or her relationship with the children in the classroom. The fact that we found that the teacher-child relationship impacted the individual level most suggests that in special education settings, it is important to focus on the dyadic relationships between children and their teachers in order to advance children's social, emotional, and behavioral adjustment. Findings of our study also indicate that when improving dyadic teacher-child relationships for children with psychiatric problems in special education, it may be more important to aim to reduce conflictual teacher-child relationships than to increase teacher-child closeness. As teacher-child conflict increased boys' disobedience, this basically implies that teachers should try not to fall into the trap of developing negative interactional patterns. Instead, they should aim to breach these negative reciprocal patterns of deteriorating teacher-child interactions and increasing maladaptive classroom adjustment of children, which may be fueled by reactive teacher strategies such as punishment (Clunies-Ross, Little, & Kienhuis, 2008). Instead, teachers may create time and opportunities for positive interactions with specific children on a daily basis by using proactive teacher strategies such as positive reinforcement.

Finally, the results of our study indicate that it is important that teachers take into account the diversity of children in special education classrooms as there were important differences between children with solely EBD and children who also have a diagnosis of ASD in the impact of teacher-child closeness. Our results indicate that there may be no immediate urgency to improve the special education classroom environment for children with ASD. In contrast, for boys with EBD in special education settings, our results stress the importance of identifying relevant protective factors for these children such as the use of social relationships. Our findings indicate that these children may benefit from a closer teacher-child relationship that may result from the use of aforementioned interventions.

Improving Classroom Relationships and Children's Classroom Adjustment using the GBG

The second research question of this thesis is: 'Can the GBG improve social classroom relationships and children's behavioral adjustment?' Given the promising results of the GBG in improving the behavioral adjustment of children in general education by targeting teacher skills and promoting positive interactions in class, we examined the effectiveness of the GBG in special education. This investigation yielded a number of findings. First, although a central aim of the GBG is that

teachers reinforce desired behavior in children - an approach that is generally found to improve teacher-child closeness (Mainhard, Brekelmans, & Wubbels, 2011) - we found no intervention effect on the teacher-child relationship. Second, we also found no effect of the GBG on peer relationships, a finding that contrasts with the positive effect found on peer relationships in a GBG study conducted in general education (Witvliet, Van Lier, Cuijpers, & Koot, 2009). Yet, although we expected improvements in social relationships to underlie improvements in children's emotional and behavioral problems (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008; Mainhard et al., 2011a), a third important finding of our study was that the GBG did prevent children's emotional and behavioral problems from getting worse. Although these effects were modest, the finding that this universal preventive intervention is able to positively affect emotional and behavioral problems in this clinical population is important, because this may also decrease the chances of these high-risk children to develop future maladaptive outcomes. Finally, we found that the intervention increased teachers' sense of self-efficacy in student engagement. However, no effects of the intervention were found on teachers' self-efficacy in managing the classroom or teacher burnout symptoms.

Taken together, the GBG can positively affect children's classroom adjustment which may be an important goal of classroom interventions in special education as these children cope with a variety of adjustment problems. Unfortunately, this was not the case for social classroom relationships, a somewhat disappointing finding because chapter 2 showed that there is room for improving social classroom relationships in special education and because chapter 3 and 4 showed how important positive classroom relationships are for these children. However, it would be too quickly to assume that the GBG intervention is not able to improve social dynamics in special education. Effects of the GBG may not show until after the second year (Leflot, Van Lier, Onghena, & Colpin, 2010) and the effectiveness of a school intervention is also dependent on the extent to which the intervention has been successfully implemented (Dane & Schneider, 1998), yet a good implementation can be challenging in school settings (Langley, Nadeem, Kataoka, Stein, & Jaycox, 2010). Therefore, we also scrutinized the dosage and fidelity of the GBG implementation in our study to be able to interpret our findings with more certainty and come up with recommendations for future implementation of the GBG in special education that may also generalize to other teacher implemented classroom-based interventions in these settings.

GBG Implementation: Dosage, Fidelity, and Recommendations for Future Practice

We investigated intervention dosage and fidelity by analysing teacher reports of each GBG session, the monthly observations by school consultants, and by analysing a number of qualitative interviews conducted with special educational teachers after the one-year implementation. First of all, our results indicated acceptable fidelity of the implementation and acceptable dosage of the intervention in special education. In addition, adherence to the GBG protocol in terms of the number of group training and individual coaching sessions was high. These results are congruent with a previous notion that the Dutch GBG implementation appears to be much stricter and higher than in other countries, because the Netherlands and Belgium are the only countries that require a licensed school consultant to monitor each teacher's progress (EMCDDA, 2013). Next, the mean number of GBG sessions over a one year period was at least comparable to that of other GBG studies (Ialongo, Poduska, Werthamer, & Kellam, 2001; Kellam, Rebok, Ialongo, & Mayer, 1994; Leflot et al., 2010; Van der Sar, 2008; Van Lier, Muthén, Van der Sar, & Crijnen, 2004). However, because we implemented the GBG only during a one-year period, the total number of GBG sessions that children received was somewhat lower than among previous GBG studies. Therefore, it may be advisable to implement the GBG in two years as to further increase GBG dosage, especially as research showed that GBG effects may only be visible after two years (Leflot et al., 2010).

This advice may be important for another reason as well; the qualitative interviews that were conducted showed that teachers sometimes felt pressured to meet all requirements of the program. Interestingly, similar complaints are also reported in a Belgian GBG study in general education that uses the same Dutch GBG protocol (EMCDDA, 2013). Implementing a new intervention can be a burden for teachers as it may lead to uncertainty and frustration (Chang, 2009), especially when the pressure is already high and teachers feel that the program interferes with daily school routines. Indeed, our results on GBG-impact on teachers showed no intervention effects on teacher burnout symptoms, although the GBG aims to reduce teacher burden (Kellam & Anthony, 1998). It appears that special education teachers face a heavy workload which was not compensated for by the effects of the intervention. Therefore, the possible gains for teachers may have been offset by the burden of implementing a new program in their already challenging classrooms. Prolonging the intervention implementation period from one to two years and thereby distributing the intervention requirements over a longer period of time may thus help to reduce the heavy demands of the intervention.

On a related matter, teacher support by their managers or school directors seemed very important for a good implementation of the program, yet was lacking in some cases. In fact, based on our own observations, a supporting management may be very important for establishing a good intervention implementation, as the opinion and the support of the school management seemed to affect teachers' attitudes regarding the program. Especially in schools in which the school management decided to implement the program without adequately consulting the teachers and did not provide much teacher support, teachers showed more initial resistance to the program. However, as there were only six schools that implemented the intervention, we cannot substantiate this claim. In contrast, we also dealt with school management that clearly showed their support for the program and that more actively involved teachers in the decision to implement the GBG. In line with previous research that showed that support of the program by the school principal contributed to successful implementation of interventions (Han & Weiss, 2005), these schools seemed more successful, at least, in creating enthusiastic teachers. It is therefore important that schools are made aware that they need to meet a number of preconditions for a good intervention implementation. It is our experience that schools that want to implement the GBG would benefit from an enthusiastic school management that (1) supports the underlying principles of GBG such as the focus on eliciting children's desired behavior and ignoring children's disruptive behavior, (2) is willing to incorporate these underlying principals in their school program, as to ensure a school-wide embedding of GBG principals, (3) is willing to help implement the intervention and enthuse teachers thus decreasing the risk of teacher resistance, and (4) helps managing teachers' workload to ensure proper implementation.

Conclusions and Educational Implications: Can Classroom Social Dynamics and Children's Classroom Adjustment Improve by Training Teachers to Implement the GBG Intervention?

Some recent changes were made within the Dutch educational system because of the new educational policy 'Passend Onderwijs' (Ministerie OCW, 2014). This new educational policy has several consequences for special and general education teachers. For special education teachers, this policy increases the likelihood that in the near future only children with the most severe psychiatric problems and special educational needs will be placed in special education settings. For general education teachers, this means that the number of children with psychiatric

problems and special educational needs in their classes will increase and they may need some support on how to manage and organize education for all these different children at the same time (Algemene onderwijsbond, 2013). This thesis may offer some support for teachers in the light of these new challenges.

What we learned is that although it is important to be aware that implementing a new classroom-based intervention may increase the workload and burden of teachers, the GBG can help teachers to manage the emotional and behavioral problems of children in the classroom. At the same time, as the GBG encompasses an individualized teacher training program, this intervention can help to contribute to teachers' competence. Yet our results also indicate that creating positive classroom interactions is very important when optimizing the educational environment for children in special education. Thus, when the GBG is used as a classroom-based intervention, teacher and children may profit from including additional intervention elements that specifically target children's social classroom relationships. These may include, for example, social skills training that is attuned to the specific needs and difficulties of a diverse population of children. Similar to GBG principles, the most important factor for successful implementation and intervention effectiveness may depend on creating a positive school environment that encourages the sharing of successful GBG experiences of teachers and children as this thesis suggests that positive social experiences can benefit children as well as teachers in special education.

Strengths, Limitations, and Future Research

The study carried out in the context of this thesis was the first to prospectively examine social classroom dynamics and children's adjustment in a large population of children with severe psychiatric problems and special educational needs. Other strengths of this study are the use of multiple informants and focus on a broad range of child, teacher, and classroom variables that all uniquely contribute to the quality of the educational environment which we examined at both the individual and classroom levels. In addition, this study aimed to improve the social classroom dynamics and children's adjustment by testing effects of training teachers to implement the GBG in a cluster randomized controlled trial. This study thereby contributed to improved knowledge on the experience and the impact of social classroom relationships for the development of behavioral problems in a vulnerable population in settings for special education that may serve future research and educational practice.

Yet, the study also had some limitations that need mentioning. The first limitation concerns the question to what extent we can generalize our findings to other children with psychiatric problems and their teachers. We only examined children with psychiatric disorders and severe behavioral problems in segregated settings for special education, yet about one-third of the children with psychiatric disorders and severe behavioral problems attends general education with extra classroom support (Inspectie van het onderwijs, 2010). In addition, as most of the children in these segregated settings for special education were boys, chapters 4 and 5 focused on boys and these results can thus only generalize to boys in these settings. Finally, special education policies for children with psychiatric disorders and additional special educational needs vary worldwide (European Agency for Development in Special Needs Education, 2010; Meijer, 2003) and can be ranked on a continuum of restrictiveness (Hocutt, 1996; Meijer, 2003; U.S. Department of Education, 2009). Thus, the generalizability of our findings to children in other countries or settings may be limited.

Second, we obtained children's psychiatric diagnoses from school medical files. This means that children were diagnosed by different medical professionals and some diagnoses were outdated or described instead of noted down using DSM-IV coding. Thus, future studies may want to assess children's diagnoses using standardized diagnostic assessments. This way, classroom dynamics may be more specifically examined and compared between children with different diagnoses.

Third, we primarily used questionnaires to assess the behavior of children and teachers, which leaves the possibility of reporter bias. Although observations of teachers' and children's behavior were initially conducted, these appeared not reliable for use in the analyses, signifying the need for practical and valid observation protocols. It would be interesting for future research to use a validated standardized observational protocol, such as the Classroom Assessment Scoring System (CLASS; La Paro, Pianta, & Stuhlman, 2004; Pianta & Hamre, 2009), to further examine social classroom dynamics. By examining more thoroughly teachers' helping behavior and the emotional support they offer children with different psychiatric problems in special education settings, training for special education teachers may be improved.

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Summary

In this thesis, the links between social classroom relationships and behavioral problems in children with psychiatric disorders in settings for Dutch special primary education are investigated. In addition, the possibility of improving special education by implementing a classroom-based intervention, the Good Behavior Game (GBG), is explored using a cluster randomized controlled design.

In *chapter 1*, the theoretical background of the study described in this thesis is presented and information on the Dutch special education system is provided. Children in Cluster 4 settings for Dutch special education are diagnosed with a psychiatric disorder - most often with an autism spectrum disorder (ASD) or with attention deficit / hyperactivity disorder (ADHD) - show severe behavioral problems and therefore have special educational needs. These children's emotional and behavioral problems and their poor social, emotional, and behavioral development into adulthood have been examined in previous studies. However, information on these children's social classroom relationships - peer relationships and teacher-child relationships - and the impact of such relationships on their behavioral adjustment is scarce. This chapter therefore presents the following two research questions of this thesis: 'Do social classroom relationships affect the behavioral adjustment of children with psychiatric disorders in special education?' and 'can the GBG intervention improve social classroom relationships and children's classroom adjustment?' To test these research questions, 414 children placed in 51 classrooms in 11 schools for special education were followed across one school year. Using a randomized controlled design, 6 schools were assigned the intervention condition and 5 schools were assigned education as usual. At the beginning, halfway through, and at the end of the school year, validated questionnaires were administered to children, their peers, and teachers regarding children's classroom adjustment, social classroom relationships, and teachers sense of competency and wellbeing.

In *chapter 2*, the characteristics of our sample of children and teachers in special education is described and compared to normative samples of children and teachers in general education. As could be expected, children in special education display substantially higher levels of emotional and behavioral problems and especially girls in these settings experience fewer positive peer relationships than in general education. Special educational teachers also experience a less close relationship with their students compared to general education teachers.

In *chapter 3*, the associations between social classroom relationships and children's classroom adjustment are examined on both the individual and the classroom levels. At the individual level, we found that children who show more behavioral problems also experience their classroom peer environment as more

hostile. At the classroom level, we found that in classes with high levels of peer victimization, all children in the classroom are in general less socially adapted. In addition, teachers' general friendliness or general positive attitude towards all children in class is not associated with children's adjustment in special education, yet individual children who have a more close dyadic relationship with their teachers show better emotional and behavioral classroom adjustment.

In *chapter 4*, developmental processes across the school year between social classroom relationships and boys' disobedient behavior are examined. We found that peer acceptance and peer rejection are equally important for the development of disobedience: peer acceptance reduces later disobedience which in turn increases later peer acceptance. Similarly, boys with high levels of behavioral problems elicit more peer rejection which exacerbates their already present behavioral problems. In addition, both teacher-child closeness and conflict do not seem developmentally affected by boys' disobedience in special education in a sense that teachers perceive their relationships with students regardless of these students' level of behavioral problems. Yet, we also showed that teacher-child conflict increases boys' disobedience throughout the school year.

In *chapter 5*, the results with regard to developmental links between the teacher-child relationship and disobedience were further explored by focusing on the two largest groups of children in special education: boys with EBD and boys with ASD. We found that boys with EBD who experience lower levels of closeness in their relationship with the teacher show increasing levels of disobedience over time, which in turn impairs the relationship as experienced by the teacher, suggesting a vicious cycle of behavioral and relational difficulties. In contrast, for boys diagnosed with ASD, the relationship with their teacher does not affect their development of disobedience and higher levels of disobedience may even positively affect their relationship with the teacher.

In *chapter 6*, the possible beneficial impact of the GBG was investigated in special education. In contrast to our expectations, it was found that the GBG did not improve classroom peer relationships or teacher-child relationships. However, the GBG did prevent children's emotional and behavioral problems from getting worse. Also, the intervention increased teachers' sense of self-efficacy in student engagement but not teachers' self-efficacy in managing the classroom. We found no intervention effect on teacher burnout symptoms.

In *chapter 7*, the findings presented in this thesis are integrated and discussed together with implications for future research and practice. The findings showed that both peer relationships and teacher-child relationships are important for the

behavioral development of children in special education and that positieve teacher-child relationships are particular important for children with EBD. The GBG offers possibilities to improve children's behavioral classroom adjustment, yet we did not find an effect of the GBG on classroom social relationships in special education. Important strengths of this thesis are that it is the first study to prospectively examine social classroom dynamics and children's adjustment in a large population of children with severe psychiatric problems and special educational needs and our aim to improve the situation in special education using a classroom-based intervention. An important limitation of this study is the question to what extent we can generalize our findings to other educational settings. Nevertheless, this study contributes to improved knowledge on the experience and the impact of social classroom relationships for the development of classroom adjustment in a vulnerable population in settings for special education. This knowledge can contribute to recommendations for the educational system in the Netherlands.

Samenvatting

(Dutch Summary)

In dit proefschrift zijn de verbanden tussen sociale relaties in de klas en gedragsproblemen bij kinderen met psychiatrische stoornissen in het speciaal basisonderwijs cluster 4 onderzocht. Daarnaast is door middel van een cluster RCT onderzocht of het mogelijk is het speciaal onderwijs te verbeteren door de interventie Taakspel in klassen in het speciaal onderwijs te implementeren.

In *hoofdstuk 1* wordt de theoretische achtergrond beschreven van de studie zoals uitgevoerd in het kader van dit proefschrift en wordt er informatie over het Nederlands speciaal onderwijs systeem verstrekt. Kinderen in het cluster 4 onderwijs hebben een psychiatrische stoornis – meestal een autisme spectrum stoornis (ASS) of een aandachtstekort met hyperactiviteit stoornis (ADHD) – met ernstige gedragsproblemen en worden daarom aangeduid als zorgleerlingen. Eerdere studies in deze populatie hebben zich gefocust op de ernstige emotionele en gedragsproblemen die deze kinderen hebben en de slechte prognose van hun sociale, emotionele en gedragsmatige ontwikkeling. Echter, de kennis omtrent sociale relaties in de klas van deze kinderen – met leerkrachten en klasgenoten – en de impact van deze relaties op hun gedrag is schaars. Dit hoofdstuk introduceert daarom de volgende twee centrale onderzoeksvragen van dit proefschrift: 'beïnvloeden sociale relaties in de klas de gedragsproblemen van kinderen met psychiatrische stoornissen in het speciaal onderwijs cluster 4?' en 'kunnen we sociale relaties in de klas verbeteren door de klasseninterventie Taakspel in te zetten?' Om deze onderzoeksvragen te toetsen zijn gedurende een schooljaar 414 kinderen gevolgd binnen 51 klassen in 11 cluster 4 scholen. Door middel van randomisatie zijn 6 scholen toegewezen aan de interventie conditie en 5 scholen aan de 'onderwijs zoals gebruikelijk' conditie. Aan het begin, halverwege en aan het einde van het schooljaar zijn gevalideerde vragenlijsten ingevuld door de kinderen, hun klasgenoten en leerkrachten aangaande het gedrag van kinderen in de klas, de sociale relaties in de klas en het gevoel van competentie en welzijn van leerkrachten.

In *hoofdstuk 2* zijn de karakteristieken van de kinderen en leerkrachten in onze steekproef in het speciaal onderwijs beschreven en zijn zij vergeleken met een normatieve groep kinderen en leerkrachten in het regulier onderwijs. Zoals verwacht hebben kinderen in het speciaal onderwijs cluster 4 aanzienlijk meer emotionele en gedragsproblemen en met name meisjes in dit onderwijstype hebben minder goede relaties met hun klasgenoten dan meisjes in het regulier onderwijs. Ook de leerkrachten ervaren een minder hechte relatie met hun leerlingen in vergelijking met leerkrachten in het regulier onderwijs.

In *hoofdstuk 3* zijn de verbanden onderzocht tussen de sociale relaties en het gedrag van kinderen in de klas op zowel leerling- als klassenniveau. Op leerlingniveau ervaren kinderen die meer gedragsproblemen vertonen ook de relaties met hun klasgenoten als meer vijandig. Op klassenniveau zijn kinderen in het algemeen slechter sociaal aangepast in klassen waar kinderen veel pestgedrag ervaren. De algemene vriendelijkheid of positieve houding van leerkrachten ten aanzien van hun leerlingen in de klas houdt geen verband met het gedrag van kinderen in het speciaal onderwijs, maar individuele kinderen die een meer hechte dyadische relatie met hun leraren hebben vertonen wel minder emotionele- en gedragsproblemen in de klas.

In *hoofdstuk 4* zijn de ontwikkelingsinvloeden door het schooljaar heen beschreven tussen sociale relaties in de klas en ongehoorzaam gedrag van jongens. Acceptatie en afwijzing door klasgenoten zijn even belangrijk voor de ontwikkeling van ongehoorzaamheid: acceptatie vermindert de mate van ongehoorzaamheid later in het schooljaar, wat vervolgens de acceptatie van jongens ten goede komt. Gelijk zo lokt een hoge mate van gedragsproblemen het uit om vaker afgewezen te worden door klasgenoten, wat hun reeds aanwezige probleemgedrag verergert. Daarnaast lijken zowel de nabijheid en het conflict tussen leerkracht en leerling niet op lange termijn beïnvloed te worden door de ongehoorzaamheid van jongens in het speciaal onderwijs, in die zin dat leerkrachten de relatie met hun leerlingen onafhankelijk ervaren van de mate van gedragsproblemen van deze leerlingen. Wel toonden we aan dat conflict tussen de leerkracht en leerling de ongehoorzaamheid van deze jongens doet toenemen gedurende het schooljaar.

In *hoofdstuk 5* zijn de resultaten met betrekking tot de ontwikkelingsinvloeden tussen de leerkracht-leerling relatie en ongehoorzaamheid verder verkend, door te focussen op de twee grootste groepen kinderen in het speciaal onderwijs: jongens met voornamelijk emotionele- en gedragsproblemen (EBD) en jongens met ASS. Jongens met EBD die minder nabijheid in hun relatie met de leerkracht ervaren vertonen later meer ongehoorzaamheid, wat vervolgens hun nabijheid zoals beoordeeld door de leraar schaadt, hetgeen een vicieuze cirkel impliceert. Voor jongens met ASS heeft de relatie met hun leerkracht geen invloed op hun ontwikkeling van ongehoorzaamheid en het vertonen van meer ongehoorzaam gedrag kan zelfs een positieve invloed hebben op hun relatie met de leerkracht op lange termijn.

In *hoofdstuk 6* wordt ingegaan op de mogelijke positieve invloed van de interventie Taakspel voor het speciaal onderwijs cluster 4. In tegenstelling tot onze verwachtingen leidde Taakspel niet tot een verbetering van relaties met

klasgenoten of de leerkracht-leerling relatie. Echter, Taakspel kan wel voorkomen dat de emotionele- en gedragsproblemen toenemen in de klas. Bovendien zorgde de interventie voor een toegenomen gevoel van eigeneffectiviteit bij de leerkracht op het gebied van leerling-betrokkenheid, maar niet op het gebied van klassenmanagement. Tevens werd er geen effect van de interventie gevonden op de burnout klachten van de leerkracht.

In *hoofdstuk 7* zijn de bevindingen zoals gepresenteerd in dit proefschrift geïntegreerd en bediscussieerd, net zoals de implicaties voor toekomstig onderzoek en de mogelijke consequenties voor de praktijk. De resultaten laten zien dat zowel de relaties met klasgenoten als de leerkracht-leerling relatie belangrijk zijn voor de gedragsontwikkeling van kinderen in het speciaal onderwijs en de laatste met name voor kinderen met EBD. Taakspel biedt mogelijkheden om de gedragsproblemen van kinderen positief te beïnvloeden, maar een jaar lang Taakspel spelen had geen invloed op de sociale relaties van de kinderen binnen het speciaal onderwijs cluster 4. Belangrijke sterke punten van dit proefschrift zijn dat dit het eerste prospectieve onderzoek is waarin sociale relaties in de klas zijn onderzocht in samenhang met emotionele- en gedragsproblemen, in een grote populatie van kinderen met ernstige psychiatrische problemen en speciale onderwijsbehoeften en ons streven om de situatie in het speciaal onderwijs te verbeteren met behulp van een klassikale interventie. Een belangrijke beperking van deze studie is de vraag in hoeverre we de resultaten van deze studie kunnen generaliseren naar andere onderwijssettings. Niettemin dragen de uitkomsten van dit proefschrift bij aan verbeterde kennis omtrent de ervaring en de impact van sociale relaties in de klas voor de ontwikkeling van emotionele- en gedragsproblemen van kwetsbare kinderen in het speciaal onderwijs. Kennis die kan bijdragen aan aanbevelingen voor de veranderende onderwijssituatie in Nederland.

Nawoord met dankbetuiging

(Epilogue with Acknowledgement)

Een collega vertelde me ooit dat ze tijdens haar bevalling dacht dat haar kindje niet echt geboren zou gaan worden. Aan die woorden heb ik vaak teruggedacht tijdens het schrijven van dit proefschrift. Het internationaal gepubliceerd krijgen van artikelen over de 4U studie, een studie naar kinderen in het cluster 4-onderwijs, was geen gemakkelijke opgave. Na vier jaar 4U moet ik concluderen dat het Nederlandse gesegregeerd onderwijs voor kinderen met gedragsproblemen internationaal gevoelig ligt en zich ook moeilijk laat vergelijken met de situatie in andere landen. Een reviewer vatte dit ooit mooi samen met: '*while I appreciate the authors' time and effort with this study, I think there is a core problem with this study related to the categories compared. Disruptive behavior disorders is not a special education category in the United States*'. Naast de inhoud van de artikelen heeft de gevoeligheid van de doelgroep dus altijd een rol gespeeld in het publicatieproces. Op internationale conferenties kregen mijn collega en ik dan ook steevast als eerste vraag '*what is your opinion about special education in the Netherlands*?'. Een vraag die ik vervolgens vaak maar meteen terugstelde gezien de emotionele lading en het feit dat deze vraag ook te complex is om op basis van alleen dit onderzoek te beantwoorden. Door de initiële tegenslagen met de publicaties van de artikelen in dit proefschrift heb ik tot aan het eind toe getwijfeld of dit boekje er ooit echt zou komen. Echter, dit mooie boekje met daarin alle kennis die ik de afgelopen jaren heb opgedaan ligt hier nu toch echt en dat heb ik naast een hoop zelfdiscipline en doorzettingsvermogen zeker ook te danken aan een groot aantal mensen.

Mijn dank gaat allereerst uit naar mijn copromotor en dagelijks begeleider bij Yulius, Nouchka Tick. Niet alleen was je onvermoeibaar in het voorzien van nuttige feedback op alle versies van de artikelen, ook je altijd positieve instelling zorgde vaak voor een gevoel van opluchting en nieuwe moed voor een volgende revisie. Ik hoop dat je helemaal tevreden bent over de invulling van je eerste eigen onderzoekslijn! Ook promotor Pol van Lier van de VU Amsterdam ben ik dank verschuldigd. Ik heb veel geleerd van, en veel plezier beleefd aan, onze vele pittige Mplus discussies en je wijze lessen rondom het publicatieproces. Je wijze lessen beperkten zich echter niet tot de inhoud van mijn promotieonderwerp. Zo heb je ook mijn kennis verrijkt met je verhalen over de eerste en tweede wereldoorlog, soms aangevuld met prachtige illustraties zoals je pentekening van de strategie van het Schlieffenplan. Promotor Theo Wubbels van de Universiteit Utrecht, jou wil ik bedanken voor je onschatbare kennis van onderwijskundige processen in Nederland en daarbuiten. Tevens was je mijn rots-in-de-branding-promotor. Je weet niet alleen wat theoretisch een goede mentor is, je bent er zelf ook één. Promotor Frank Verhulst en Jan van der Ende van het Erasmus MC, met zoveel

begeleiding om me heen was het fijn dat ieder zijn eigen specialisme had en een eigen rol innam op dit project. Jullie hadden alleen maar bemoedigende woorden tijdens de uitvoer van de interventie en een immer kritische blik bij het finetunen van de artikelen. Dank voor jullie altijd positieve feedback, zonder jullie was deze promotie niet mogelijk geweest! Dit geldt ook zeker voor Athanasios Maras, directeur van de Yulius Academie, bij wie ik vier jaar lang mijn onderzoek heb mogen uitvoeren. Dank voor het helpen opzetten en bekostigen van dit belangrijke onderzoek en het mij geven van deze mooie kans. Ten slotte wil ik ook de overige leden van de promotiecommissie hartelijk danken voor het lezen en beoordelen van mijn proefschrift.

Dit onderzoek was verder niet mogelijk geweest zonder de subsidie van ZonMW en de samenwerking met de CED-groep, met name Chris Struiksma, die verantwoordelijk was voor de Taakspel interventie. Daarnaast ben ik dankbaar voor de medewerking die ik kreeg van de verschillende cluster 4-scholen en hun directie: Pauline van Buren van De Radar, André Lourens van De Opperd, Barbara Munnik van De Gunningschool, Inger Bonhof van De Kleine Prins, Harrie Stellaard van De Pels, Kees Boer van Veldheim, Peter van Bremen van De Noordweg, Dianne van den Berg van het Discovery College, Angelique Snoei-Baan van De Zuidoever, Hélène Timmers van De Dijk, Karla van den Broek van De Wilgen, Nynke Beek-Hartstra van De Linge en Nell Schepers van De Drechtster. Ook een woord van dank voor alle onderzoeksassistenten die niet alleen alle metingen hebben verricht maar ook een kei waren in het opbouwen en onderhouden van goede relaties met de leerkrachten: Iris Ham, Thomas Puvill, Yasemin Yigittop, Britt van Wijk, Susanne van Drumpt, Sophie Vijfvinkel, Mariska Bouman, Nadia Bohovic, Ariëlle van Heeren, Gesida van den Akker, Hanke van den Ende, Nathely Golstein, Kirsten Voerman, Marinka van Wingerden, Evelyn Oostvogel, Jennifer Maasdamme, Nassira Ajarai, Annelot Blankenberg, Daniëlle Wijlaars, Fieke Wijers en Yvonne Rijks, jullie waren een superteam. En een speciaal woord van dank voor degene die het gehele team op kantoor coördineerde, Carolien Roosen, jouw structuur en overzicht waren onmisbaar in dit project en je was dan ook mijn steun en toeverlaat. Tenslotte mijn dank aan de belangrijkste personen zonder wie dit onderzoek niet mogelijk zou zijn geweest: alle leerlingen, ouders en leerkrachten die ruim een jaar lang door ons zijn bevraagd, geobserveerd, beluisterd en geïnterviewd. Dit onderzoek is uitgevoerd voor en door jullie en zonder jullie medewerking had het onderzoek niet kunnen slagen.

Natuurlijk wil ik hierbij ook al mijn lieve collega's bij Yulius bedanken. Ten eerste Juliette Hopman, met wie ik dit ambitieuze project samen ben aangegaan.

Al jouw voorbereidende werk en de adviezen (‘*manisch enthousiast blijven*’) en anekdotes (‘*kun je geen onderzoek naar ratten doen?*’) waren allemaal van onschatbare waarde voor het goed opzetten van mijn eigen project. Wat hebben we veel hoogte- en dieptepunten gekend en hoe fijn is het om een collega te hebben die van de dieptepunten (zoals bijvoorbeeld een bepaalde vliegreis naar Helsinki) ook hilarische hoogtepunten kan maken. En lieve, lieve Katleen Geladé, wat heb ik met je gelachen. Ik ken geen persoon die harder werkt dan jij en toch was je altijd vrolijk dankzij je motto ‘*niet klagen maar dragen!*’. Ik had me met jou en Juliette geen betere kamergenoten kunnen wensen, al zullen de tomatenplantjes daar misschien anders over denken ;-). Kirsten Visser, ik heb het helemaal aan jou te danken dat Taakspel zo strak is verlopen op de interventiescholen. We weten nu allebei wat een uitdaging het is om in de dagelijkse hectiek van de schoolpraktijk een geprotocolleerde interventie uit te voeren. Sylvana Robbers, wat vormden we samen een leuk statistisch en methodologisch adviesteam en wat ga ik je missen. Dank voor je geweldige afscheidscadeau, *‘it’s absolutely stunning’*. Judith Holland, Kirsten Hoogendijk, Kim Bul, Lida Efstathopoulou, Fatima Khan, en iedereen wiens naam ik ben vergeten, dank voor alle gezelligheid tijdens de lunchpauzes en het tuinieren. Ik heb geleerd dat het maar een kleine wereld is, dus hopelijk werken we in de toekomst nog eens samen!

Minder inhoudelijk betrokken, maar onmisbaar waren verschillende familieleden en vrienden die me de afgelopen jaren hebben gesteund. Met name Iris van Tulder, Michelle en Pepijn Kromhout, Maaike de Jong, Stefan van Osch, Jantine van den Bosch en Bastiaan Smit die, erg belangrijk, steeds weer mijn promotieperikelen aan wilden horen, meedachten en hielpen te relativeren onder het genot van een kop thee of goed glas wijn. Ook Anne-Marieke en Wouter Apner-Meij, de creatieve geesten die uiteindelijk de kaft en lay-out van mijn prachtige boekje voor hun rekening hebben genomen. Tenslotte, Erik van Tulder, mijn vriend die tijdens dit traject ook mijn echtgenoot werd, dank voor al je liefde, geduld en steun in deze periode. Hoe bijzonder is het om iemand lief te hebben die me zelfs als ‘*academic groupie*’ wil volgen naar het buitenland voor de volgende academische positie.

Nu dit boekje af is en ik fulltime aan de slag ben met een volgend onderzoeksproject kan ik eindelijk zeggen: ik leef niet meer 4U.

Curriculum Vitae

Linda Breeman was born on the 29th of May, 1980 in Leidschendam, the Netherlands. She completed her secondary education in 1998 at the Comenius College in Leeuwarden and started studying Clinical and Health Psychology at the University of Groningen. After two years, she continued her studies at Utrecht University. During her study, she worked at the department of Methodology and Statistics where she analyzed gender differences in Utrecht University's employee satisfaction survey. For her master thesis, she worked nine months at Rutgers WPF, an international centre of expertise on sexual health, on the topic of sexual education of students. She received her Master's degree in Psychology in 2003.

After her graduation, she worked as a junior researcher at Utrecht University from 2004 to 2007. At the department of Social Psychology, she investigated the impact of gender, social, and cultural differences in sexual self-concept as an explanation of unwanted pregnancies among young people, a research project funded by ZonMw. At the department of Methodology and Statistics, she was involved in a meta-analysis project on peritraumatic dissociation and the development of posttraumatic stress disorder. As a tutor, she taught several courses on the topics of health psychology, questionnaire design, basic and advanced statistics, and statistical software programs such as SPSS, AMOS, and HLM.

Between 2008 and 2010, she broadened her teaching experience in problem-based learning (PGO) by working as a tutor at the Psychology department at Erasmus University Rotterdam. In 2009, she received a Bachelor's degree in Education as well as her Basic University Teaching Qualification (BKO). At Utrecht University, she helped teaching a two-week summer course in multilevel analyses at the University of Essex. As a lecturer, she helped to develop the methodology and statistics 3-year curriculum of a newly established bachelor programme for academic teaching in primary education (ALPO). In addition, she was responsible for a biennial 360 degree feedback report of the employee satisfaction survey, as commissioned by Utrecht University's executive board.

In 2010, she started as a PhD student at Yulius Mental Health and Erasmus MC, a project in close cooperation with VU University Amsterdam and Utrecht University of which the results are described in this thesis. During her PhD, she also provided statistical support for colleagues, was involved in analysing and reporting of Routine Outcome Monitoring (ROM) data, and supervised the thesis of two master students from Leiden University.

In 2014, she started working as a research fellow at the Psychology department at the University of Warwick, UK. She is involved in 'The Bavarian Longitudinal Study', concerning the long-term outcomes of children born very preterm.

Publications and Presentations

Thesis-related work

International Journals

Breeman, L.D., Van Lier, P.A.C., Wubbels, T., Verhulst, F.C., Van der Ende, J., Maras, A., Hopman, J.A.B., & Tick, N.T. (2014). Developmental links between disobedient behavior and social classroom relationships in boys with psychiatric disorders in special education. *Journal of Abnormal Child Psychology,* Epub ahead of print.

Breeman, L.D., Wubbels, T., Van Lier, P.A.C., Verhulst, F.C., Van der Ende, J., Maras, A., Hopman, J.A.B., & Tick, N.T. (2015). Teacher characteristics, social classroom relationships, and children's social, emotional, and behavioral problems in special education. *Journal of School Psychology*, Epub ahead of print.

Breeman, L.D., Van Lier, P.A.C., Wubbels, T., Verhulst, F.C., Van der Ende, J., Maras, A., Struiksma, A.J.C., Hopman, J.A.B., & Tick, N.T. (2015). Effects of the Good Behavior Game on the behavioral, emotional, and social problems of children with psychiatric disorders in special education settings. Provisionally accepted for publication in the *Journal of Positive Behavior Interventions*.

Manuscripts Submitted

Breeman, L.D., Van Lier, P.A.C., Wubbels, T., Verhulst, F.C., Van der Ende, J., Maras, A., Hopman, J.A.B., & Tick, N.T. *Differences between boys with severe emotional and behavioral problems and boys with autism in developmental links between disobedience and teacher-child closeness.*

Manuscripts in Preparation

Hopman, J.A.B., Van Lier, P.A.C., Van der Ende, J., Wubbels, T., Verhulst, F.C., Maras, A., Breeman, L.D., Tick, N.T. *Developmental links between externalizing behavior and student-teacher relationship characteristics in adolescents with psychiatric problems.*

Hopman, J.A.B., Van Lier, P.A.C., Van der Ende, J., Struiksma, A.J.C., Wubbels, T., Verhulst, F.C., Maras, A., Breeman, L.D., Tick, N.T. *Effects of a classroom-based behavioral management program on behavior and occupational wellbeing of teachers in special secondary education.*

Hopman, J.A.B., Van Lier, P.A.C., Van der Ende, J., Struiksma, A.J.C., Wubbels, T., Verhulst, F.C., Maras, A., Breeman, L.D., Tick, N.T. *Impact of a preventive intervention on special needs adolescents' psychopathology and social relationships.*

Book Chapter

Breeman, L.D., Tick, N.T., Wubbels, T., Maras, A., & Van Lier, P.A.C. (2014). Problem behavior and the development of the teacher-child relationship in special education. In: D.B. Zandvliet and P. Den Brok (Eds.), *Interpersonal relationships in education: From theory to practice.* Rotterdam: Sense Publishers.

Dutch Journals

Tick, N., Hopman, J., Breeman, L., Kahn, F., & Maras, A. (2011). De 4U studie: Een aanpak van ADHD in het speciaal onderwijs. *ADHD Actueel, 8*, 1-6.

Tick, N., Hopman, J., Breeman, L., & Maras, A. (2011). Een effectieve aanpak van ADHD in de klas? *ADHD Wachtkamerspecial, 8*, 1-6.

International Oral Presentations

Breeman, L.D., Hopman, J.A.B, Tick, N.T., Van Lier, P.A.C., Wubbels, T., Verhulst, F.C., Van der Ende, J., Maras, A. (2014). Interactions in special educational classrooms: Developmental links between boys behavioral problems and social classroom relationships. *International Conference on Child Development in Schools and Community Settings (CDSCS),* Rotterdam, the Netherlands.

Breeman, L.D., Hopman, J.A.B, Tick, N.T., Van Lier, P.A.C., Wubbels, T., Verhulst, F.C., Van der Ende, J., Maras, A. (2012). Disruptive behavior in special education classrooms: The effect of a classroom-based intervention and the role of the teacher-student relationship. *International Conference on Interpersonal Relationships in Education (ICIRE),* Vancouver, Canada.

Breeman, L.D., Hopman, J.A.B, Tick, N.T., Van Lier, P.A.C., Wubbels, T., Verhulst, F.C., Van der Ende, J., Maras, A. (2011). Psychopathology and interactions in special education classrooms. *European Symposium of Child and Adolescent Psychiatry (ESCAP),* Helsinki, Finland.

Dutch Oral Presentations

Hopman, J., & Breeman, L. (2012). De leerkracht als ordehandhaver of sinterklaas: de invloed van de leerkracht op gedrag en relaties in de klas. *Wetenschapsmarkt Yulius,* Hendrik-Ido-Ambacht.

Breeman, L., & Hopman, J. (2011). Psychopathologie in het cluster 4 onderwijs: Eerste resultaten van de 4U studie. *Wetenschapsmarkt Yulius,* Hendrik-Ido-Ambacht.

Breeman, L., & Tick, N. (2010). Methodologie voor dummies: wetenschappelijk onderzoek binnen RMPI - De Grote Rivieren. *Wetenschapsmarkt Yulius,* Hendrik-Ido-Ambacht.

Poster Presentations

Breeman, L., Tick, N., Hopman, J., Van Lier, P., Wubbels, T., Verhulst, F., et al. (2010). 4U studie: Onderzoek naar de effecten van de taakspel interventie in het cluster 4 onderwijs. *Jeugd in Onderzoek,* Nieuwegein, Nederland.

Hopman, J., Breeman, L., Tick, N., Van Lier, P., Wubbels, T., Verhulst, F., et al. (2011). Do's and don'ts in intervention research. *The Ins and Outs of Intervention Research: Making it Work!* Utrecht.

Other Work

International Publications

Lensvelt-Mulders, G., Van der Hart, O., Van Ochten, J.M., Van Son, M.J.M., Steele, K., & Breeman, L. (2008). Relations among peritraumatic dissociation and posttraumatic stress: a meta-analysis. *Clinical Psychology Review* 28, 1138-1151.

Maes, J.P.M.A., Nazir, P.R.N., Delger, C.N., Breeman, L.D., & Van Gool, A.R. (2014). Antipsychotic treatment discontinuation in clinical practice. *The Lancet Psychiatry, 1*, 500-501.

Dutch Publications

Breeman, L., Wit, J. de, & Woertman, L. (2006). Jongeren en hun seksuele zelfbeeld: implicaties voor seksuele gezondheidsbevordering. *Soa Aids Magazine* 4, 12-15.

De Wit, J., Breeman, L., & Woertman, L. (2005). Hoe beredeneerd is seksueel gedrag van jongeren? *Tijdschrift voor Seksuologie* 29, 125-131.

Fulpen, M. Van, Bakker, F., Breeman, L., Poelman, J., Schaalma, H., & Vanwesenbeeck, I. (2002). *Vmbo scholieren, seksualiteit en seksuele vorming.* Een effectonderzoek naar de vernieuwde versie van het lespakket 'Lang leve de Liefde'. Utrecht: Rutgers Nisso Groep.

PhD Portfolio

Name PhD student:	Linda Breeman
PhD period:	March 2010 - July 2014
Erasmus MC department:	Child & Adolescent Psychiatry
Promotors:	Prof.dr. F.C. Verhulst
	Prof.dr. P.A.C. Van Lier
	Prof.dr. T. Wubbels
Supervisor:	Dr. N.T. Tick

PhD Courses

	Institute and place	Year	ECTS
Loopbaanoriëntatie,	Loopbaancentrum Erasmus MC Rotterdam	2013	1.2
Multilevel analyses in Mplus	Methodology & Statistics, Utrecht University	2013	1.4
English biomedical writing and communication	NIHES, Rotterdam	2012	4.0
Pre-conference workshop: How to deal with missing data	Methodology & Statistics, Utrecht University	2011	0.3
Psychiatric epidemiology	NIHES, Rotterdam	2011	1.4
Missing values in clinical research	NIHES, Rotterdam	2011	0.7
Access	Fastlane Solutions, Rotterdam	2011	0.7
Presenting your research at conferences	IVLOS, Utrecht University	2011	1.0
Structural equation modeling using Mplus	Graduate school, Utrecht University	2010	1.0
Fundamentals of statistics	FSW, Utrecht University	2009	7.5

Observed and latent categorical variable modeling using Mplus	Methodology & Statistics, Utrecht University	2006	1.0
Multilevel analysis (MlwiN)	FSW, Utrecht University	2006	3.8
Theory construction and statistical modeling (AMOS)	FSW, Utrecht University	2005	7.5
Multivariate statistiek en missing data-analyse	FSW, Utrecht University	2005	2.1

Conferences and Symposia

	Year	ECTS
International Conference on Child Development in Schools and Community Settings (CDSCS), Yulius Mental Health, Rotterdam	2014	2.4
Symposium '100 jaar onderwijswetenschappen - een tussenstand', FSW, Universiteit Utrecht	2014	0.3
Verspreidings- en implementatiebijeenkomst (VIMP) Taakspel, ZonMw, Den Haag	2013	1.3
5th Mplus users' meeting, Methodology & Statistics, Utrecht University	2013	0.6
Symposium 'Statistics gone wild', Netherlands Society for Statistics and Operations Research (VvS/ OR), Tilburg	2012	0.3
Conferentie Taakspel, GGD Amsterdam & CED-groep	2012	0.3
Annual meeting AERA: 'None satis scire: To know is not enough', American Educational Research Association, Vancouver	2012	1.1
2nd International Conference on Interpersonal Relationships in Education (ICIRE), Vancouver	2012	2.4

Wetenschapsmarkt, Yulius GGZ, Hendrik-Ido-Ambacht	2012	1.0
3rd Mplus users' meeting, Methodology & Statistics, Utrecht University	2011	0.6
14th International congress of European Society of Child and Adolescent Psychiatry (ESCAP), Helsinki	2011	3.0
39e Voorjaarscongres Nederlandse Vereniging voor Psychiatrie, NVVP, Amsterdam	2012	1.0
Wetenschapsmarkt, Yulius GGZ, Hendrik-Ido-Ambacht	2011	1.0
Symposium 'Wijzer in implementeren', Jeugd in Onderzoek, Ede	2011	0.3
2nd Mplus users' meeting, Methodology & Statistics, Utrecht University	2011	0.6
Symposium 'The ins and outs of intervention research: Making it work!', FSW, Utrecht University	2011	1.0
Symposium 'Peer influences on the development of psycho-pathology', Faculty of Psychology & Education, VU Amsterdam	2010	0.3
1st Mplus users' meeting, Methodology & Statistics, Utrecht University	2010	0.6
Wetenschapsmarkt, Yulius GGZ, Hendrik-Ido-Ambacht	2010	1.0
Congres 'Diversiteit in het jeugdbeleid', Jeugd in Onderzoek, Nieuwegein	2010	1.0

Teaching

Teacher training / qualification	Institute	Year
Basis Kwalificatie Onderwijs (BKO)	IVLOS, Universiteit Utrecht	2009
Bachelor in Education	Hogeschool Domstad	2009
Course coordinator / developer / lecturer		
Statistiek met SPSS	Yulius Academie, Yulius GGZ	2012
Methoden van onderwijsonderzoek	ALPO, Universiteit Utrecht	2009+ 2010
Methoden & statistiek 3: context psychologische functieleer	Psychologie, Universiteit Utrecht	2009+ 2010
Methoden van onderwijskundig onderzoek	Onderwijskunde, Universiteit Utrecht	2008+ 2009

Supervising workgroups / practicals		
Introduction to multilevel analysis with applications	Essex Summer School In Social Science Data Analysis	2009
Grondslagen psychologische diagnostiek en testtheorie	Psychologie, Universiteit Utrecht	2008
KwantitatiefA (SPSS en AMOS)	Onderwijskunde, Universiteit Utrecht	2007
Assessment en evaluatie in onderwijs en opleiding (SPSS)	Onderwijskunde, Universiteit Utrecht	2007
Onderzoekspracticum psychologie	Psychologie, Universiteit Utrecht	2007
Gezondheidspsychologie	Psychologie, Universiteit Utrecht	2007
Gezondheidsbevordering	Psychologie, Universiteit Utrecht	2007
Statistiek met de computer (SPSS)	ASW / CA / Sociologie, Universiteit Utrecht	2004
Vragenlijstconstructie	ASW, Universiteit Utrecht	2003
Experimentele methoden en statistiek (SPSS)	CKI, Universiteit Utrecht	2003
Statistiek bachelor 1	ASW / CA / Sociologie, Universiteit Utrecht	2003
Gecontextualiseerde statistiek en methoden	Psychologie / Onderwijskunde, Universiteit Utrecht	2002

Supervising Master's theses		
I. Ham. 'Leerkrachten en leerlingen (on)bewust (on)handig. De leerkracht-leerling relatie in het cluster 4 speciaal onderwijs uitgesplitst naar psychopathologie van leerlingen.'	Clinical Child and Adolescent Studies, Universiteit Leiden	2012
G. van Esch. 'Onderzoek naar Taakspel bij leerlingen in het cluster 4 onderwijs.'	Educational Studies, Universiteit Leiden	2012
R. van Middelaar & A. Onderwater. ''Als je diegene kent, je weet hoe en wat, dat 'ie niet ziek is, dan is het toch veilig vrijen?!"	Klinische en Gezondheidspsychologie, Universiteit Utrecht	2006
C. Richel. 'Effectieve communicatie ten aanzien van veilig vrijen onder jongeren: effecten van matching en framing van voorlichtingsinformatie.'	Klinische en Gezondheidspsychologie, Universiteit Utrecht	2006
S. Kalsbeek. 'The relations between self-construal, regulatory focus, and regulatory pride'	Klinische en Gezondheidspsychologie, Universiteit Utrecht	2006
H.J. Nieuwenhuizen. 'Body image, self-esteem, sexual activities and sexual self-schemas: Differences between Dutch homosexual and heterosexual adolescents.'	Klinische en Gezondheidspsychologie, Universiteit Utrecht	2006
R. van Dijkhuizen. 'To be or not to be: een onderzoek naar het seksuele zelfconcept van adolescente jongeren in Nederland.'	Klinische en Gezondheidspsychologie, Universiteit Utrecht	2006
R. Wolterig. 'Seks, sekse & religie.'	Klinische en Gezondheidspsychologie, Universiteit Utrecht	2006
I. Duijser & E. Zandbergen. 'Let's think about SEX baby.'	Klinische en Gezondheidspsychologie, Universiteit Utrecht	2005
M. Stout. 'De invloed van cultuur en het zelf op informatieverwerking.'	Klinische en Gezondheidspsychologie, Universiteit Utrecht	2005

Tutoring		
Mensen in groepen	Psychologie, Erasmus Universiteit Rotterdam	2007
Verschillen tussen mensen	Psychologie, Erasmus Universiteit Rotterdam	2007
De nieuwsgierige mens	Psychologie, Erasmus Universiteit Rotterdam	2007
De denkende mens	Psychologie, Erasmus Universiteit Rotterdam	2008
De veranderende mens	Psychologie, Erasmus Universiteit Rotterdam	2008
Normaal of abnormaal	Psychologie, Erasmus Universiteit Rotterdam	2008
De werkende mens	Psychologie, Erasmus Universiteit Rotterdam	2008
De lerende mens	Psychologie, Erasmus Universiteit Rotterdam	2008